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Railway Age

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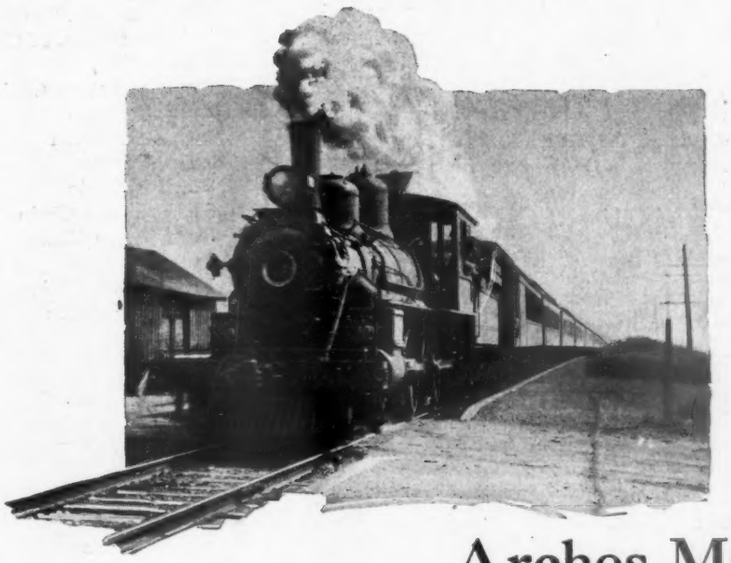

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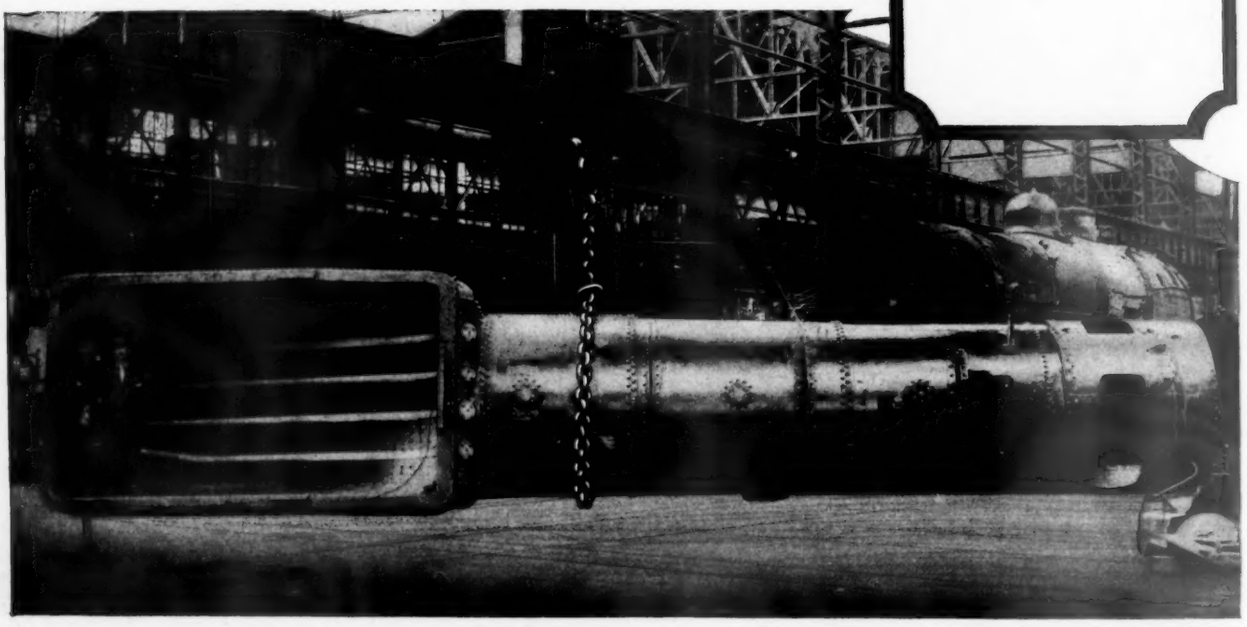

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EDITORIAL
Railway Age

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Positive Public Regulations Work

THE PURPOSE of public relations work is to make the public understand the problems of the railroads, appreciate the benefits they confer, and comprehend why their managements cannot make lower rates or give better and more adequate service unless the public will permit the creation of conditions which will make these things possible.

Public relations work should be both positive and negative. In the past it has been too largely negative. It has been restricted too narrowly to remedying conditions which caused and justified complaints about service instead of preventing development of the conditions in the first place. It has consisted too largely of explaining transactions after they have been criticised instead of explaining them promptly in order to prevent misunderstanding and criticism of them. It has been devoted too much to disproving charges of mismanagement which never could have been effectively made if the good features in railroad management had been pointed out to the public before the misleading attacks upon it had occurred.

In 1920 the railways made the best record for safety in operation in their entire history. In spite of the great increase in their mileage, in the number of employes and in the amount of traffic handled they killed fewer people than in any year since 1899. This remarkable achievement should have been made known through advertising to all the people of the United States. Attention was called to it in an editorial in the *Railway Age* which was reprinted in many newspapers. It was not, however, given anywhere near the publicity it deserved, and consequently the railways did not get anywhere near the credit for it they deserved. In many cases a single accident has been given more publicity and has influenced the attitude toward the railways of more people than all the facts about the accident record of 1920, which reflected the results of ten years of effective "safety first" work. Adequate public relations work of the right kind would have brought this remarkable achievement to the attention of the people in every community.

Many passenger trains are late. Many people think most of them are late. The percentage of passenger trains on time on the leading railways of the country is, however, relatively high. The public ought to be given every good record of "on time" performance so that it may not base its opinion of passenger train service on the relatively small number of cases where trains are late.

The average capitalization per mile of the railways of the United States is the smallest of any important system of railways in the world. The comparative statistics regarding railway capitalization in this and other countries should be presented to the public over and over again through advertising. This positive presentation of facts will, in the long run, produce more effect than all the refutations that can be made of charges that the railways are overcapitalized.

The rapid development, and the great increase of wealth and comfort in the United States have been mainly due to the rapid development of our railways and to the fact that they have been the leaders of the world in providing cheap transportation. Every railway has a history which, if skillfully and interestingly told through advertising as a part of the history of the territory and the communities it serves, would tend to make the public understand and appreciate it better.

Great pleasure can be derived from a trip by railroad under favorable conditions. The railroads have spent large amounts of money for advertising to tell the public about the attractions of Colorado, California and Florida. Why not spend some of this money to call the public's attention to the comfort and safety with which the railway trips may be made to these places and to the perfect organization, the fine equipment, the good roadbeds, the block signal systems, which have to be provided and are maintained at great expense to make these long trips by railroad in comfort and safety possible?

These are but a few examples of innumerable forms of public relations work besides arguments about valuation, wages and "states' rights" which could be and ought to be carried on with benefit to both the railroads and the public.

In order to sell anything permanently to the public at a profit the public must be convinced that it is a good thing and that those who sell it are entitled to make a profit on it. The railways must adapt to the conditions in their business the methods of salesmanship, publicity and advertising used by concerns of other kinds if they are ever to so sell their service to the public as to cause the public gladly to pay what it is reasonably worth.

Cutting Down the Cost of Distribution

If we contrast the price of goods to the producer with the cost to the consumer, as compared to the difference which existed seven years ago, we will find that the spread is now much greater. This distortion seriously affects the interests of one or both parties. It is particularly severe in the case of the former. The economic balance must be reestablished in the United States as soon as possible. A considerable part of the increased spread is due to taxation and there is very little likelihood of this being materially reduced for a long time. The other alternative is to restore the balance by increasing the efficiency of production, transportation and distribution. The last two phases are of special interest to the railroads. The last point—distribution—makes an especial appeal to railroaders from the standpoint of reducing the costs of handling freight at terminals and also through direct or store door delivery in large cities. While much consideration has been given to these questions in recent years, the economic urge at the present time is such as to force focusing greater attention upon them.

Short Time-Limit for Damage Claims

If you were to ride on a drover's pass on the Oregon Short Line, and were to be injured in a collision or derailment by the railroad's fault, you would need to be alert to present your claim for damages; for one of the conditions of the pass stipulates that claims must be presented to the general manager in writing within 30 days; a claim presented after that would have no standing in a court. This is the decision of the Supreme Court of the United States, as reported in our last issue, page 588. The fact that the railroad company's physician knew that the drover was injured and was confined to the hospital for about 30 days did not excuse the claimant for neglecting to write. We do not know how many other roads include such a time limit in the conditions on their passes, but it seems proper to call particular attention to this decision, because of the unusual circumstances, that so far as the lawyers could discover, this point concerning the time limit had never before been presented to any court. The fine distinctions between freight damage claims and bodily injury claims concerning which three of the judges of the Supreme Court differed with the other six, suggest that our courts are not likely ever to go out of business for lack of hairs to split.

Paint Spraying in Railroad Shops

The application of paint to railroad equipment by the spraying process may safely be said to have passed the experimental stage. In fact some roads have developed paint spraying to such an extent that a large proportion of all equipment, including both cars and locomotives, is painted in this way. The essential advantage of spraying is the greater speed with which surfaces can be covered, but it is often possible to utilize a lower priced operator than would be necessary with brush painting and the total reduction in labor cost is increased proportionately. Paint can readily be sprayed in corners and crevices which would be difficult, if not impossible, to reach with a brush; and with the proper precautions practically no paint is wasted. While more paint is required to cover a given surface with a spray as compared with a brush, one coat applied by the former method is said to be equal to two applied by the latter and there is a saving of material as well as labor. It has been found possible to spray varnish, in which case an enamel finish is secured and this fact has broadened the field of paint spraying to include passenger as well as freight cars. The possibilities of economy may be appreciated by consideration of a typical example. A box car has been spray-painted by one 54-cent man in 15 minutes, whereas it would take a 72-cent man about four hours to apply the paint with a brush. The relative amounts of paint used are 9 and 11 gallons.

Big Exhibit in Atlantic City

The exhibit committee of the Railway Supply Manufacturers' Association, which has charge of the exhibit at the Atlantic City conventions of the Mechanical Division and the Purchases and Stores Division of the American Railway Association in June, is facing an embarrassing situation. It has 95,000 square feet of exhibit space at its disposal, not including the space in the balconies in the main entrance hall. This was used two years ago, but did not prove entirely satisfactory. Over 90,000 square feet was allotted at a meeting of the exhibit committee held at Pittsburgh on March 10. Since that time a number of additional applications have been received, some by telegraph. It will be difficult, if not impossible, to provide additional space of a satisfactory sort, and the prospects are that many of those who want to exhibit will be turned away this year. It is not too early to look ahead to 1923 to determine what arrangements can be made to furnish more adequate exhibit quarters for the meeting in that year. The educational value of the exhibit has been more and more appreciated in recent years—the wise exhibitor, realizing this, has studied to make his exhibit as effective as possible from this standpoint. The number of subordinate officers and foremen who visit the conventions, largely to see and study the latest devices and best practices, has steadily increased from year to year, and will no doubt surpass previous records this year. With the success of the exhibit fully assured, it is to be hoped that the Mechanical Division will exercise more than usual care in the preparation of its technical program. Detailed reports on standards and recommended practices are good, as are also studies and research data as to devices and designs. There are, however, more important problems which in the past have not received the consideration which they deserved and which must be recognized in the future if this Division is to hold its own. These include problems relating to the human element, management and operating questions, as well as to a consideration of many of the larger and broader technical problems, including the selection of equipment, and its proper repair and maintenance. Many of these were referred to in special articles which were published in the *Railway Age* of June 10 and August 20, 1921. Will the Mechanical Division measure up to the opportunity which lies before it?

The Class in Consolidations

Discussions of contemplated railroad consolidations appear in the public prints in such a variety of interesting forms that it is difficult to avoid being facetious with reference to them. We are, in this note, going to succumb to the temptation. About two years ago there appeared in the Atlantic Monthly an interesting article purporting to be an interview with Dame Experience and a description of the work done in her well known School of Experience. Our memory of the article is hazy but as we remember, the theme was that Dame Experience had a large number of pupils who had been attending the school for many years with more or less uncertain results. There were also some comments about the tuition, the expensiveness of which, the interviewer quoted Dame Experience as saying, had not served as a deterrent on the size of the enrollment. This analogy we can apply to Dame Rumor. Apparently she also has a school, one of the most promising departments of which is the class which is specializing at present on the Consolidation of Railroads. Apparently this

class in Railroad Consolidations had its mid-year graduating exercises last week and some unusual graduation theses were presented. One dealt with the consolidation of the Missouri Pacific and the Texas & Pacific. Another with that of the Ann Arbor and Pere Marquette. A third with the joint control of the Nickel Plate and Clover Leaf. The scholar that presented the last named must have received a degree with distinction because he amplified the idea that probably this meant a new system consisting of the Lackawanna, the Nickel Plate and the Clover Leaf. Dame Rumor's scholars have one advantage that other college men do not have and that is the wide publicity given the ideas they present. This has been especially true of the members of the class in consolidations. Without intending any reference to the consolidations above mentioned, we often wonder how Dame Rumor's scholars must feel in case their ideas prove true after all—that is, in the few cases when they do prove true.

Safety First and Management Responsibility

Managements may make rules governing safety requirements and employees may read them carefully, yet no rules of this sort can be 100 per cent effective at all times when, as prevails in the majority of cases, their enforcement depends largely upon the judgment and responsibility of the men concerned. A recent accident, although happening in England, where eight men out of a track gang of nine were killed while working on the line, is an example. In this case the foreman, a railroad man with 19 years' experience, depended upon hearing approaching trains when a train was passing the gang on an adjacent track. Although the rules stated that where danger might arise a lookout or whistleman should be used, the foreman, in his endeavor to get his work completed, evidently assumed this task himself, only to forget it in the performance of the work, such as a foreman may naturally do. As stated, the enforcement of any rule governing safety first, or, to be specific, the use of a whistle-man or the clearing of tracks by track forces, depends largely upon the foreman. If his judgment is sound and his understanding of the risks and hazards involved is complete, the responsibility is well placed, but it is by no means entirely his alone. The dividing line between a safe condition and a hazardous one is not clearly defined; rather it is an area wherein the actual safety or risk at any one point may be influenced or controlled largely by the attitude of the management. If in the matter of whistle-men, the management shows a coolness toward their free use because of financial or other reasons, foremen are going to assume the task themselves and the danger element has increased. Even though there is no coolness on the part of the management there is still a wide difference between passive encouragement and positive encouragement. To be effective, encouragement must be along positive lines, not only for the paramount factor of safety but for more material reasons as well. Men invariably work with greater freedom and perform better when assured of proper protection.

Clover Leaf Acquired

The acquisition by the Van Sweringen interests of a controlling interest in the Toledo, St. Louis & Western, as announced by O. P. Van Sweringen last week, is the most interesting development of its kind that has taken place since Henry Ford acquired the D., T. & I. The step establishes a community of interest between the Nickel Plate and the Clover Leaf which should be of far-reaching importance. Benefit should result to both companies concerned and if things work out as one would naturally expect, there will be a considerable effect on traffic relationships in the highly competitive territory between Buffalo and the Mississippi river. In spite of the Van Sweringen activity in the new terminal project at Cleveland the Nickel Plate has not been much in the public eye in recent months. The road has, however, been doing some exceedingly interesting work. Its success in moving fast freight trains promptly and efficiently has in a measure made it the envy of some of its competing and connecting lines and the road "stands in" extremely well with the shippers. The Nickel Plate operates 523 miles of line all constituted in the main line from Buffalo to Chicago. Its operating statistics would, of course, reflect the advantage of having no branch lines; they also seem to indicate that the road is taking full advantage of its being all main line. The Clover Leaf is similarly a line without branches. It extends from St. Louis to Toledo, 453 miles, and access to Detroit is given through joint control with the Grand Trunk Western of the Detroit & Toledo Shore Line. Connection with the Nickel Plate is made at Continental, Ohio. The Clover Leaf's position in the highly competitive territory it serves should be considerably improved by its being in the same hands as the Nickel Plate. The Nickel Plate will presumably be in a much better position insofar as concerns St. Louis business and it is to be expected that the Clover Leaf will have the advantage in a much greater degree than it now has of Nickel Plate traffic solicitation for the routing via Continental. If the expected happens the Nickel Plate-Clover Leaf route will become one of the leaders in St. Louis-Buffalo fast freight business.

Agents as Railway Spokesmen

The local agent is one of the chief points of contact between the railway and the public. He is, probably more often than not, a member of the local chamber of commerce or other business organization and upon his ability to represent the railroad adequately depends, to a considerable extent, its standing in the community. The agent should be able to interpret his company, and the railroads in general for that matter, to his fellow citizens. To do this he should be generally informed about the problems of his railroad and be in a position to meet with facts any misstatements or thoughtless criticism which might injure his company or tend to influence public opinion against the railroads in general. With this in mind it was with considerable pleasure that we learned that special meetings of agents with the division superintendents on several divisions of at least one important road had been called to better equip the agents concerning their opportunities in this direction. At one of these meetings each agent was asked to describe the railroad's public relations position in his city. It was found that criticism for the most part was directed at rates. Apparently the general public has a very inadequate conception of the reductions in rates which have already been made. Accordingly it was decided to ask the traffic department for a concise summary of the reductions that had been brought about, in order that the agents might easily give some figures to offset careless criticism whenever the opportunity should present itself. As a good, broad summary of present railroad conditions, Secretary Hoover's recent testimony at the Interstate Commerce Commission rate hearings was read and discussed and copies distributed for further study. Agents were urged to watch local papers carefully for criticism of the railways and to appeal to their superiors for means to meet criticisms which they found difficult to answer. Those in attendance at the meeting seemed thoroughly alive to their opportunities in this field and interested in helping with the work. Enlisting the agents as spokesmen appears to be one of the first steps which a railroad should take in securing public support. It should not, however, be the only effort put forth in that direction.

So interwoven are all the economic factors which together bring about general prosperity or depression that anyone can well doubt a sweeping statement to the effect that improvement of conditions in agriculture, foreign trade or any other one field of activity is the key to the present situation. The fact is that, in most cases, prosperity in one will more likely parallel than follow prosperity in another industry. That a revival of foreign trade can be expected as financial conditions abroad gradually improve seems to be a safe assumption. There are doubtless ways and means by which this improvement could be expedited. To discuss these matters is the object of the Ninth National Foreign Trade Convention which will be held at Philadelphia on May 10, 11 and 12. These annual foreign trade conventions and the National Foreign Trade Council, under whose auspices they are held, have accomplished a great deal in educating American manufacturers regarding the importance of foreign trade and in the best methods of building up a foreign market. The ninth convention will carry on the good work of the former conventions. The program for this year, however, shows the same lack of appreciation of the importance of the railway transportation and the railway supply aspects of foreign trade that was shown in the preparation of the program for last year's convention, which was held at Cleveland. The American equipped railway abroad is a natural promoter of American trade in other commodities. In many of the foreign countries which are looked upon as the most promising markets for American goods the railways are now operated under European methods and with European equipment, in spite of the fact that under conditions of high tonnage of low grade freight and sparse population American methods have proved their superiority. Furthermore, American investments abroad, which play such an important part in creating a market for our products, go largely into railway construction and equipment. Railway men who appreciate the value of foreign trade as a builder of traffic and supply manufacturers who desire to increase their sales abroad will find much to interest them at this convention. It is unfortunate, however, that those in charge of these conventions are continuing to show such a slight appreciation of the railway and railway supply aspects of the foreign trade problem.

The Foreign Trade Convention

Railway Rates, Coal Prices and Miners' Wages

NO OTHER INDUSTRY is more interested in the present wage controversy between the coal operators and miners than the railroad industry. The railroads buy more coal than any other industry. The necessity for their present rates is due to their present operating expenses and their present operating expenses are due, in a substantial degree, to the prices they are paying for coal. The prices they are paying for coal in turn, are due largely to the present high wages of the miners. The prices the railways are paying for coal have declined substantially within the last year. The average paid by them reached its maximum in December, 1920, when it was $4.80. It declined throughout the year 1921 until at the end of the year is was only $3.65. These figures include the freight rates in all cases where railways pay freight on their coal. The average price paid in the entire year 1921 was $4.14.

The average price paid by the railways in 1916 was $1.76. Their locomotive fuel in that year cost them $250,500,000. In 1920, it cost them $673,000,000. In 1921, owing to reductions both in the prices paid and the amounts of coal consumed, the total cost of fuel was approximately $557,000,000. While this represents a substantial reduction as compared with 1920, it represents an increase over 1916 of over $300,000,000, or 133 per cent. Even at the end of 1921 the average cost per ton of railroad coal was more than twice as great as in 1916. The coal mine operators contend that the present freight rates are too high in proportion to the present prices of coal and should be reduced. But the rates are not as high in proportion as the present prices. The railways naturally take the view that as long as the prices are so high they, as the largest buyers of coal, should not be required to reduce the rates on it.

The fact is that the wages of the miners, the prices charged by the operators, and the freight rates of the railways ought all to be reduced in the order mentioned. The present wages of the miners were fixed two years ago when prices of commodities, cost of living, and wages of all classes of labor were at their peak. They are practically the only class of working men who since then have not had their wages reduced. The mine operators should have the support of every purchaser of coal and of railroad transportation in their efforts to secure reductions in miners' wages. Any interference by the Government which may tend in the slightest degree to prevent a prompt and adequate reduction of miners' wages should receive prompt condemnation from public sentiment.

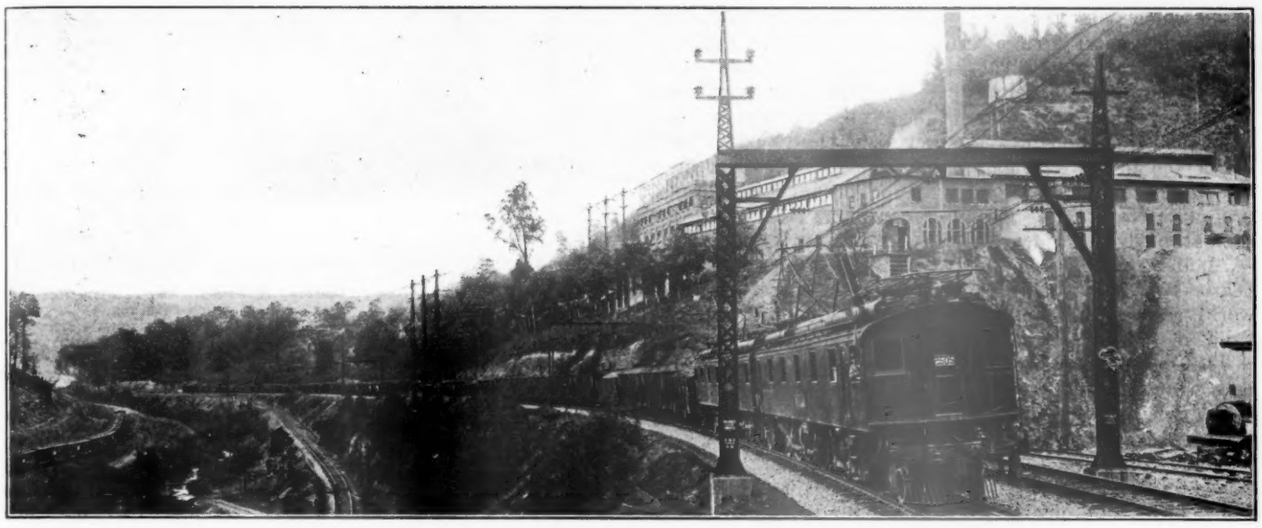
Rolling Tie Plates from Rail Steel

IN SPITE OF ALL the attention which railway men and manufacturers have given the rail problem during the last ten years failures continue to occur in large numbers and the situation is far from reassuring. While progress has been made in eliminating certain types of defects, other and more dangerous ones have appeared in even greater numbers. Although the rails from certain mills appear to show a larger proportion of failures than those from other mills, no mill seems to be immune.

It is common knowledge that the poorer metal is found in the top of the ingot from which the rails are rolled. In recognition of this fact all specifications provide for this metal at the top to be discarded, the amount of this discard commonly being left indefinite under the provision that "sufficient metal shall be sheared from the top of the ingot to insure sound rails." It is to be expected that the manufacturers endeavor to reduce this discard to the minimum since this metal can be used elsewhere only at a loss. That this discard is not in general sufficient to eliminate all of the unsound metal is indicated by the fact that over one-half of all of the rail failures occur in the "A" or top rails of the ingot. In other words, if the "A" rails could be eliminated the failures would be cut in half. Surely this is an objective worth working for, but other uses must be found for this discard.

While this is a manufacturing rather than a railway problem, if the roads can assist in its solution they will aid their own cause. One recent entrant into the rail manufacturing field has agreed to discard all "A" rails and to find use for this metal for other purposes in its plant. The percentage of "A" rails to the total ranges from 15 to 20 according to the size of the ingot, or sufficient to provide a full complement of tie plates for the rails.

The use of tie plates of rail steel is not new, for a number of roads have, for several years, accepted plates which have been rolled from the off-heats or those which have failed to comply with the specifications and they have given satisfactory service in track. The use of high carbon steel plates is increasing each year, although at the present time over 60 per cent of the plates rolled are still of low carbon content. If the roads which are now using these low carbon steel tie plates should agree to accept those of high carbon steel they would afford an outlet for a large part of the "A" rails and remove the most serious objection which the steel manufacturers could offer to an increased discard.



A 3,250-Ton Train on the Norfolk & Western Hauled by Two 11,000-Volt Alternating Current Locomotives

Effects of Electric Power Used for Traction

The Question of Inductive Interference and Electrolysis as Related to Railroad Electrification

By Professor Chas. F. Scott

THE STEAM RAILROADS of the United States are carefully studying improvements that will enable them to handle their traffic as soon as general business conditions reach a normal state. These investigations naturally bring the question of electrification into prominence and incidentally other problems related to electrical operation. In the past there has been considerable discussion of both inductive interference and electrolysis that may result from alternating current or direct current electrifications. It should be fully recognized that changes in the method of operating such extensive public utilities as the railroads are liable to cause disturbance in exposed circuits of communication companies, if no preventive measures are taken in the individual systems or their mutual relations. This has been the record of the past and the modifications introduced have generally resulted in the betterment of both services to the public. A review of the past and present conditions show that remarkable progress has been made in overcoming the difficulties encountered and that the conditions surrounding interference and electrolysis are now pretty well understood.

Telephone circuits are quite liable to induction from adjacent circuits unless suitable precautions or remedial measures are taken. A second telephone circuit causes cross-talk unless the wires are suitably transposed. Similarly, telephone circuits are liable to reproduce the clicks in nearby telegraph wires. The telephone has experienced some new trouble from each new kind of power circuit during the past 30 years; the direct current railway, arc lighting, alternating current transmission and alternating current railways have produced their own individual and particular problems. In a sense none of these problems have been solved as each condition constitutes a continuing problem; each new case as it arises may have special features calling for particular consideration.

A score of years ago the noise in telephone circuits having a single wire and ground return, which was caused by the ripples in the current to street cars, was taken to the courts for settlement. The telephone has changed its circuits, the complete metallic circuit is less susceptible to disturbances; the ripples in trolley current have been reduced; and engineering conferences have replaced controversy in court. The improvements have been progressive. Telephone circuits are better insulated; they are better balanced and transposed and changes in apparatus have been made. Power generators have been improved and power circuits are planned in various ways to lessen the amount of induction in parallel circuits. In spite of all these things there remains the inherent sensitivity of telephone circuits to interference rendering each installation a problem for specific consideration.

Difficulty With Early Electrifications

In recounting experience with specific electrifications, it will be found that great progress has been made in reducing interference incident to both direct current and alternating current railways.

The New York, New Haven & Hartford was the first large alternating current electrification put into operation. A commercial telegraph line along the right-of-way requiring reconstruction in part on account of physical hazard was moved to a distance to avoid anticipated inductive interference. The induced voltages were very large but the railroad telegraph lines along the right-of-way continued in service by means of compensating transformers.

When the electrification was extended from Stamford to New Haven the three-wire power system was devised and installed. In the change to the three-wire system on the original electrification, the existing trolleys and feeders were simply reconnected to balancing transformers. A very great reduction in inductive interference resulted, which is satisfactory to the telephone company and enables the railroad to operate its telegraph and telephone service in a cable along the railroad with drainage coils and without compensating transformers.

On the New Canaan branch of the New Haven system, where the conditions were peculiarly difficult, changes were

made which reduced the very severe interference to the telephone when short circuits occurred on the railroad averaging a few times a month (at rare intervals occurring several times a day) to the point where there is little interference.

In the Paoli electrification of the Pennsylvania near Philadelphia modifications in the power system and various measures taken in the telephone plant have very greatly reduced the ringing of the telephone bells and the breaking down of protectors when short circuits occur. Short circuits are now comparatively infrequent.

Another installation, the Norfolk & Western, installed nearly 10 years ago, where the heaviest train service in the world (considering weight of trains, grades and speed) is handled, has not produced serious inductions.

The latest alternating electrification, the Chestnut Hill branch of the Pennsylvania near Philadelphia, profiting by past experience and embodying the latest engineering, has not produced interference.

Summarizing, on some of the single phase railways designed 15 years ago and 10 years ago, there were difficulties which have been greatly reduced or eliminated by changes in the power system and in the telephone apparatus; in the latest railway installed there has been no interference. This is a story of experience which gives good promise for the future.

It may be noted that the methods employed for obtaining this improved service are not revolutionary nor difficult of application but are adaptations of well known appliances or methods to secure the desired results. The early plants were the first in a new field of operation. The data obtained in tests made after installation and under operating conditions in these plants enable calculations to be made beforehand and as a result of the experience thus gained, the handling of future installations is on a very different basis from that which obtained in the past. It may be noted, however, that the conditions which determine the amount and effective position of the railway return current which diverges from the track and flows through the earth are important factors. These are variable elements whose value in a particular locality can be accurately determined only by test. Favorable earth conditions due to networks of underground pipes, may have been a contributing factor in the Chestnut Hill line.

Although it is known that too high induction under ordinary operating conditions may cause interference, a great many engineers have been surprised that the important problem in connection with alternating current railways is not avoidance of noise but that the serious disturbances to the telephone occur only for the instant that high voltage is induced under emergency conditions such as short circuits. It is, therefore, important to consider the matter of short circuits and the methods of minimizing their effects.

A significant comparison has been made between the voltage induced in the telephone circuits by short circuits in an alternating current railway and in power circuits with solidly grounded neutral for a number of corresponding conditions believed to be such as might arise in practice. The disturbance in the telephone circuits was in all cases greater when caused by a power circuit than by a railway, ranging from an increase of 30 per cent to several hundred per cent.

The obvious conclusion is that power transmission circuits with solidly grounded neutral may be expected to produce telephone disturbances of the same kind and even of greater intensity than those caused by electric railways. The latter, however, may occur more frequently as trolley lines supplying locomotives are more liable to accidental short circuit than transmission lines supplying substations.

Comparison Between Alternating and Direct Current Railways

On the alternating current railroads referred to noise has not been a factor of any consequence but on the Chicago, Milwaukee & St. Paul, the outstanding direct current electrification, the noise conditions under normal operation were such as to require a remedy which was found by a change in generator construction and the installation of resonant shunts.

Interference with grounded telegraph or other types of grounded signaling may occur due to difference of direct ground potential in d.c. railways. The difference in ground potentials incident to a 3,000-volt installation may far exceed those caused by a 600-volt system.

The greatest problem in telephone interference from alternating current railways occurs at the time of the momentary maximum current or short circuit. The principal effect is the breakdown of telephone protective devices which may result in acoustic shock. If the conditions are made such that the induced voltage caused by short circuit is within proper limits the conditions under normal operation will in general be quite satisfactory.

Under short circuit conditions on d.c. railroads tests have shown that telephone protectors may be grounded by the action of the momentary induced voltages and that light acoustic shocks may be experienced by persons listening on nearby parallel telephone circuits.

Comparison between the effects of a.c. and d.c. short circuits shows that the effects of short circuit surges will be less severe with a high voltage d.c. system than with an a.c. system. While there may not be large differences in the peak voltages induced in the two cases the amount of energy transferred to the communication circuits will be greater in the a.c. case due to the longer duration of the short circuit condition, since the initial transient is followed by several cycles of short circuit current. In the d.c. case, there is only the brief initial surge followed as a rule by a smaller voltage of still shorter duration in the reverse direction, and, as experience shows, the effect is comparatively small.

The remedy for serious inductive interference when short circuit occurs may, therefore, be anticipated in a quick-acting circuit breaker for alternating current. Such a breaker is now being designed and its successful completion will enable the effects of short circuits to be very greatly reduced.

In case of either a.c. or d.c. electrifications, there will be alternating current transmission lines for supplying power to the substations. The transmission lines of 60 cycles for supplying the direct current trolley system give rise to inductive interference which is greater than when caused by a.c. transmission lines of 25 cycles serving the a.c. trolley system. This fact made the use of loud speaking telephones necessary on the Chicago, Milwaukee & St. Paul dispatching telephone circuits.

The New Haven four-track electrification handles heavy traffic through a succession of towns and cities. The Paoli four-track and Chestnut Hill double-track branches of the Pennsylvania provide frequent service to the suburbs of Philadelphia. These alternating current railroads pass through highly congested districts where the effects of interference are liable to be much more serious than elsewhere.

The Chicago, Milwaukee & St. Paul direct current has occasional trains on a single track road extending many hundred miles through the mountains and a sparsely settled country.

The conditions are not comparable. If the initial direct current 3,000-volt electrifications had been called upon to meet the New Haven or Pennsylvania requirements, the experience with direct current operation would have been quite different from that recorded for the Chicago, Milwaukee & St. Paul or the experimental line at Erie, on which the maximum distance for which tests are recorded is 1.8 miles.

The Telephone Circuit

It has been customary to classify as incident to interference with communication system a long list of possibilities.

It does not appear that certain of these possibilities have rarely if ever been realized; for example, magnetization of loading coils, and the breakdown of the insulation of cables or of interior equipment, such as coils, condensers and associated wiring. Nor is there any statement that the overheating of apparatus or a fire hazard are other than apprehensions after many years of experience. They must all, however, be classed as possibilities, although they may never have occurred by induction from railways. Some of these phenomena have been caused by induction from power transmission circuits.

The purpose of the protector (which places short air gaps between each wire and ground) is to form a ready path for high voltages to pass to earth, thus protecting the telephone. The protection, however, is not ideally perfect as high voltages, such as may be caused by lightning or short circuits in parallel electric circuits, may cause acoustic shock. The conditions are delicate and exacting so that improvements are difficult. But an ideal protector would go far to reduce the affect of short circuits, just as an ideal line insulator would go far to prevent short circuits. Ideal perfection in each seems remote, but improvements are much to be desired.

It is generally recognized that precautions must be taken in the layout of both a.c. and d.c. electrifications to avoid interference that will affect the service given by telephone systems. On the whole, the d.c. has an advantage over the a.c. from the standpoint of interference but in planning either a d.c. or an a.c. electrification special precautions must be taken. The precautions may involve special features in the electrification plans.

In both systems of electrification supplementary measures must be taken in the layout of the communication circuits as well as every effort taken to maintain first class conditions in the telephone systems. Generally comparisons that have been made of the relative modifications necessary on electrifications have not been on systems having similar service conditions. While it is recognized that modifications are necessary, definite estimates should be the basis of decision rather than general indefinite assumptions as to complication and expense of some particular feature. Judgment as to the merit of a particular project should be left until the final plans and estimates are completed.

Electrolysis

The effects of corrosion by the alternating current under ordinary conditions of practice may be considered negligible. The well-known electrolytic action of 600-volt street railways occurs also with high voltage systems. The "high voltage," however, implies less current and hence less electrolysis for the same power delivered. Furthermore, much of the mileage of a high voltage railway is presumably in the country where underground pipes are few. These features obviously render the electrolytic problem less serious than it would be if the voltage were lower and there were pipes along the right-of-way.

On the other hand, the power and the current taken by heavy trains reach large figures, and the railways have city terminals and in some cities there is large mileage in the city districts. Chicago, for example, has several thousand miles. Precautions may be taken by arranging short feeding distances, but this implies additional substations and substations with 3,000-volt motor-generator sets and usually with expert attendance tend to increase cost. Substations will necessarily be needed near city passenger terminals and freight yards where heavy currents for starting trains are needed. The corrosion of pipes said to have occurred in the pipe near substations along the Milwaukee 3,000-volt railway indicate conditions which may have far more serious results when the substations are in large cities unless suitable precautionary measures are taken. These should be provided and their cost considered on the same basis as measures to obviate inductive interference in the a.c. system.

Summary

The following specific statements regarding inductive interference, and electrolysis by alternating current railways, supplement the preceding general discussion and the comparison between the effects caused by direct current and by alternating current railways:

1. *Inductive Interference.*—The problems involved are complex, but the conditions are pretty well understood so that provision can be made for mitigating disturbances. In alternating current electrification great progress has been made in handling inductive interference. Theory and the experience gained on several roads under different conditions have been continuously contributing to the solution of the problem. The latest installation has produced no interference. Certain changes in alternating current railway equipment and in telephone equipment will go far to avoid difficulties elsewhere.

In direct current high voltage electrification the experience is practically limited to one system. It is stated that the difficulties there encountered have been overcome by changes in generators and by the addition of the resonant shunts.

Although in both alternating and direct current electrification the general causes and conditions are known, it is important to determine what measures should be taken to meet the particular situation in each case. The problem is to determine the best solution. It may call for modifications in the railway system, or in the telephone system or in both. Determination of the course to be taken should as far as practicable be made before installation and should be such as to involve the least total cost for rendering both services.

2. *Electrolysis.*—The effects of corrosion by alternating currents under ordinary conditions of practice may be regarded as negligible.

Direct current railways, whether at high or low voltage, have the same inherent tendency to corrosion on underground metal by electrolysis. The same kind of remedial measures which are employed in connection with street railways are applicable to the high voltage systems. The cost should be included as a part of the cost of the electrification.

It is generally agreed that inductive interference and electrolysis are matters which should be taken into consideration when an electrification is being planned; that provision be made to prevent difficulties; that the plan should, on general principles, be that which is cheapest, whether this means special arrangements in the power system or in the telephone system, or separation of the two, the plan in a particular case being that which will involve minimum cost.

Photo by Keystone View Company

Students Helping During Strike in Germany

The Burlington Uses Creosoted Cypress Piling

By G. A. Haggander
Bridge Engineer, Chicago, Burlington & Quincy

FOR A NUMBER OF YEARS the Chicago, Burlington & Quincy has been using red oak piles treated with creosote for the larger part of its pile trestle bridges. The results obtained have been satisfactory, but the care required to get the piling properly cut, loaded and seasoned has been very great. At times the market has been such that this kind of timber has been hard to get.

In looking around for a possible substitute it was found that there was a large amount of cypress available close to its lines. This is known as white cypress and is found in south-eastern Missouri and north-eastern Arkansas. It has considerable sapwood and if used untreated would have a short life. Heart cypress resists decay well and it was thought that if the sapwood was thoroughly treated good results as to life would be obtained. After purchasing a small amount of this early in 1921 serious doubts were entertained as to whether it could be treated properly. Experiences of others were that it was highly resistant to the absorption of creosote and as far as known it had not been treated successfully.

J. H. Waterman, superintendent of timber preservation of this road, felt confident that this particular kind of cypress would take treatment and after the piling had been seasoned somewhat experiments began. The piling was still a little green and the creosote oil not first-class, but the treatment of the first charge was successful. The piling was steamed three hours and subjected to a vacuum for four hours, after which creosote to the extent of 28 per cent by volume was injected. A good penetration was found.

After the piling was seasoned thoroughly and some first-class creosote oil received other tests were made. Charges of piling 30 ft. long and 60 ft. long were treated to refusal, after which some piling was cut to obtain cross sections, and others were tested by means of an increment borer. The piling was first steamed for two hours at 20 lb. pressure. A vacuum was drawn for four hours with a maximum of 24 in. The solution pressure was then applied for 11 hrs. 20 min., working up to the maximum pressure of 175 lb. in one hour. This pressure was held until the end of the pressure period, at which time the pump did not take anything out of the measuring tank for one hour. A final vacuum was drawn for 30 min. The net absorption was 23.01 lb. of oil per cubic foot.

In treating piling of this kind for regular work it is proposed to leave in about 13 lb. of creosote oil per cu. ft. The piling will be steamed for two hours at a pressure of from 15 to 20 lb. per sq. in. A vacuum will then be drawn and held for at least 15 min. after the maximum has been reached. Before the creosote solution, heated to 180 deg. to 200 deg. F. is introduced, the vacuum will be broken to such an extent that the kick back will be large enough to leave about 13 lb. of creosote per cu. ft. in the pile. Forty-five minutes will be taken to bring the pressure up to the maximum of 150 lb. per sq. in., and it will be held until the refusal point is reached. A final vacuum will be drawn until the piling can be withdrawn from the retort without drip.

About 150 piling, 50 ft. in length, have been driven recently in a river bridge through coarse sand and gravel. The penetration obtained has been 40 ft., but the driving is so difficult that even with the aid of jet pipes an average time of nearly 1½ hours is required on each pile. The piling has stood up under this severe service in an excellent manner, driving fully as well as red oak and far superior to cedar. Most of these piling were cut 4 ft. from the butt end, and typical cross sections are shown in the illustrations. Penetration in practically all cases is very thorough.

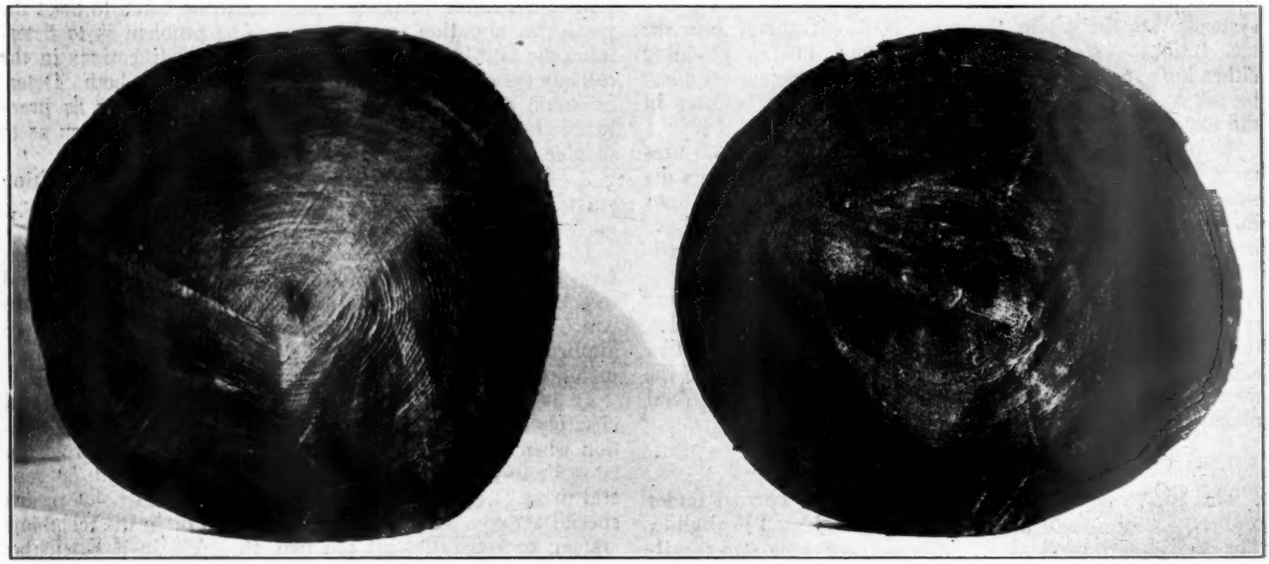


Fig. 1 Fig. 2

From the data obtained, the treatment can be done satisfactorily; the piling will stand extremely hard driving and the life of the piling will be as great as that of any other kind obtainable on the territory through which the road passes; this, because of a lower cost for the timber, results in a substantial economy.

NO PASSENGER KILLED, or seriously injured, in 1921, is the record of the British (civilian) airplanes, according to a London paper. This record covers an extensive traffic. During the summer, between 400 and 500 people a week were crossing the channel by air, and well over 1,000 a week were being taken up for joy rides in England. Credit is given to the skill of the pilots and mechanics, the aeronautical inspection department and the controller of aerodromes and licenses. Only first class men and machines have been allowed to carry passengers.

Commission Brings Rate Hearings to a Close

Shippers Base Argument for Reductions Mainly on Claim That They Would Stimulate Traffic

WASHINGTON, D. C.

THE GENERAL RATE HEARING before the Interstate Commerce Commission which has been in progress since December 14 was concluded on March 13 after five days of oral argument. The direct argument on behalf of the railroads was presented on March 8, as reported last week. This was followed by arguments on behalf of the shippers and state commissioners, most of whom based their contentions on the theory that rate reductions would so stimulate traffic as to tend to increase revenues. Some did not directly ask for rate reductions but merely asked that if the commission found any reductions justified their commodities should be given early consideration or not be left out. Railroad rebuttal argument on behalf of the carriers was heard on March 11 and 13.

F. W. Putnam of the Minnesota commission devoted his argument mainly to urging a reduction of passenger fares. The present rates, he said, are keeping people from traveling except where it is necessary and are inducing them to ride in automobiles in many cases instead of by train. He urged it particularly, he said, from the standpoint of public relations, saying that whereas 18 months ago the carriers had the good will of the public, now they have the bad will of the public and this condition can be changed if they will go back to a three cent a mile rate. He claimed this would not result in a reduction of revenues.

When Mr. Putnam said that with a normal traffic the present rates would make more than six per cent, Commissioner Potter asked if it is not necessary for the commission to establish a rate basis that will make substantially more than six per cent part of the time in order that the average income shall be a fair return. John E. Benton also made an additional argument on behalf of state commissions.

N.I.T.L. Asks General Reduction If Any

John S. Burchmore, for the National Industrial Traffic League, urged a general reduction of rates as soon as the carriers can stand the reduction on the ground that the rates constitute a burdensome tax on industry. The thinking public, he said, has been in doubt as to the facts as to the ability of the carriers to stand a rate reduction, but the commission should now be in a position to decide as a result of this investigation, and the league took the position that any reduction should be general and horizontal, applied to all commodities, corresponding to the method by which the rates were advanced. He suggested that if the commission should not find a general reduction justified at this time it would have a stabilizing effect if the commission could issue a definite statement that rates will not be reduced for a certain period. He also suggested that the commission should give the railroads moral support by a public announcement that it is the high labor bill that makes high rates.

Commissioner McChord asked if the commission should deal in the same way with other expenses. Mr. Burchmore said the commission could properly do so, but that he did not think the facts were the same. Commissioner Daniels asked if the record before the commission is sufficient to justify it in making such a statement. Burchmore replied that at least the commission should go as far as the record would justify.

Referring to statements that any reduction that could now be made would be too small to be felt if made general, Mr. Burchmore recalled that the commission once took 19,000 pages of testimony on a five per cent advance in eastern territory.

R. C. Fulbright, on behalf of the Southwestern Industrial Traffic League, said that the operating costs during 1921 largely reflected the peak prices of materials and supplies purchased in 1920 and that large reductions have since been made. He also predicted an increase of traffic in 1922 and on this basis declared that under present rates the railroads would earn an excessive income.

S. H. Cowan, representing livestock interests, said that the requirement of the six per cent rule is impossible of fulfilment when taken in connection with the requirement that rates shall be reasonable and is, therefore, not obligatory upon the commission. The livestock industry, he said, cannot pay the rates and survive, while the railroads say they cannot reduce rates and survive; hence the only rule for the commission is to order reasonable rates under Section 1. That, he said, will meet the requirement "as nearly as may be."

Paul E. Blanchard for the National Fertilizer Association, asked a reduction of 25 per cent in rates on farm fertilizer and fertilizer materials. He said that every other factor in the industry except freight rates has been reduced to the 1913 basis, and that for every ton of fertilizer the railroads carry they will have from one to four tons of some other commodity to haul next year. He contended that a reduction in rates would be given to the consumer in the form of a reduction in price and would, therefore, increase buying power.

Thorne Asks That Rates Be Deflated

Clifford Thorne asked a reduction in rates on petroleum and products on the ground of the condition of the producers and the high percentage of freight rate to f. o. b. prices, which, he said, had been greatly deflated. He asked that the railroads be required to make a similar deflation of their rates. He said that the Ex Parte 74 advance had had a demoralizing effect on the industry and over 50 per cent of the refining plants in the mid-continent field are now idle.

Speaking for the American Farm Bureau Federation, Mr. Thorne said:

"We heartily commend the action of the commission in making the reductions on grain, hay and livestock. We appreciate what the carriers did in making the general reduction of 10 per cent on other agricultural products throughout the United States, the first reduction on any basic commodity nation-wide in its extent. But we desire the commission to notice that the general 10 per cent reduction was not proposed by the carriers until after the decisions in the grain and livestock cases had been entered, and not until after a petition had been filed with this commission requesting a general reduction of 10 to 20 per cent on basic commodities throughout the United States. Consequently the assistance and the action of this commission constituted a very potential factor in securing this result.

"We sincerely trust that this commission, or the carriers, will make such further reductions as the facts will justify. For that reason we are profoundly concerned in a fair accounting of the carriers' revenues and expenses and in the determination of that fundamental issue. What constitutes a reasonable rate of return? Specifically, as to agricultural products, at this time we have a few definite recommendations to make.

"First, we believe the reductions previously ordered by this commission as to grain, hay and livestock, should be extended throughout the balance of the United States. The

revenue involved in these further reductions would not be large in extent.

Our second recommendation is that those other farm products which have not received the 10 per cent reduction shall be granted the same. Ground phosphate rock was being produced in the spring of 1920 in large quantities and the plants were going to full capacity; but in the fall of that year, within two months of the effective date of the Ex Parte 74 rates resulting from that decision, half of these plants were closed down and one of the largest went into bankruptcy. We do not believe the railroads would make serious objection to a 25 per cent reduction in the freight rates on this commodity. The facts would seem to warrant such action." He also asked for reductions on seeds and agricultural limestone.

Mr. Thorne said that while the constructive year exhibits showed a net return of 4.8 per cent, or $907,000,000, based on the traffic of last year, the net for the last half of 1921 was three times as great as that for the first half, and that assuming the increase in tonnage that may be expected, the railroads should earn over a billion dollars, or over 5 per cent for 1922. He said since the tentative valuation of $18,900,000,000 and the return of 6 per cent were adopted in 1920, wholesale prices have dropped 50 per cent, and interest rates 25 per cent. He also attacked the statements that the showing of 1921 was made largely at the expense of maintenance. If the entire Ex Parte 74 advance cannot now be removed at least half of it should be removed, particularly on basic commodities, Mr. Thorne said, and the case should be kept open for further hearings from time to time as to particular commodities. It is not necessary at this time for the commission to announce a percentage which constitutes a fair return. This should be done only after a careful investigation, he said.

Reduction in Coal Rates Urged

Rush C. Butler, on behalf of the National Coal Association, said that material reductions in bituminous coal rates should be required and are necessary before there can be a revival of business and industry. The economic importance of coal, he said, is such that these rates deserve special consideration and lower rates on coal will reduce the unit operating expenses of the carriers. The rates, he said, should be cut "not by a mere 5 per cent or 10 per cent, but substantially, to the bottom."

C. B. Ellis, on behalf of the Southern Traffic League, took the "constructive year" exhibit filed by the Southern roads based on the traffic of 1921, and by assuming a normal yearly increase in traffic said it showed they would earn more than 6 per cent in 1922.

W. E. McCormack, representing interior Iowa packers, said that under existing rates they cannot compete in trunk line territory. Twenty per cent of their product is fresh meat, but the difference of 40 per cent in the rate on meat over that on hogs has made it impossible to ship the meat at a profit, and they cannot exist under this differential. He asked that the relationship which existed before General Order 28 be restored.

Edwin Brooker, for the National Association of Sand and Gravel Producers, urged a reduction on the ground that the present rates are so high as to produce only a minimum of revenue.

Francis B. James, on behalf of the lake furnace interests, objected because the railroads had reduced ex-lake ore rates without similarly reducing the coal rates, in which his clients are interested. He said the railroads were trying to show they had made so many reductions on other commodities that they could not afford to reduce coal rates. He urged a reduction in coal rates as the one commodity that enters into every kind of industry and the one in which a reduction would have the greatest effect in stimulating other industries.

Wilbur La Roe, Jr., appeared for the Chicago Association of Commerce in place of his partner, former Commissioner E. E. Clark, who had been retained by the association to support the position that any reduction in rates should be general and horizontal. Mr. Clark is ill. If any reduction should be made, he said, it should be a moderate horizontal reduction, with possibly a few special exceptions. The association does not ask for a reduction in freight rates and does not take the position that the decline in business was solely due to freight rates, but it believes that any reductions should be made on a horizontal basis in the way they were advanced.

Mr. La Roe opposed the suggestions made by Secretary Hoover that class rates be not reduced or possibly be advanced, pointing out that they include not only high-class merchandise but also many raw materials and others that are of the same character as articles that are given commodity rates. He also said that an advance in class rates would increase the disadvantage of the l. c. l. shipper. In view of the concentration of coal traffic on certain roads, he said he could not understand how any one who intends to be fair can argue for a reduction of 50 or 75 cents a ton on coal rather than a general reduction. A general reduction, he said, would narrow the increased differentials which are a burden to so many shippers.

Any substantial reductions, Mr. La Roe said, would not be warranted at this time, but the entire country needs help and a rate reduction would stimulate traffic slightly. He said he would not ask a reduction in passenger fares. He suggested that if a 10 per cent increase were made and failed to stimulate business the commission could put the rates back, but he agreed with Commissioner Hall that such action would have a most unfortunate effect.

Speaking for his own clients, Mr. La Roe said that if any general reduction is made, roofing slate should not be left out, on the ground that the present rates are most indefensible because they are higher than rates on prepared roofing. Commissioner Potter asked if it would not be better to stabilize industry on the present rates than to make small reductions now with the possibility of having to increase them later. Mr. La Roe said he could not see how the commission could take any very definite action with the Labor Board occupying the position it does.

R. W. Ropiequet argued for a reduction in coal rates on the ground that as a basic commodity a reduction would stimulate industry and thus lead to an increase in the tonnage of the coal-carrying roads. The only way to get back to normalcy, he said, is to cut every kind of cost to the bone.

F. L. Ballard asked for reductions on furnace materials and anthracite coal. He said it costs $13 today merely to "fetch" the materials entering into a ton of pig iron which sells for $20, leaving only $7 to buy the materials. The market will not pay more than $20 and unless there can be a radical reduction in freight rates it is impossible to sell it at cost. Speaking for the anthracite operators not affiliated with railroads, Mr. Ballard urged a reduction to enable a reduction in the price to the consumer.

J. Van Norman, representing the southern hardwood lumber interests, said it is admitted by all that rates are too high and that it is the commission's duty to exercise a business judgment in fixing rates in an attempt to produce a given return. He argued that the commission should reduce rates on raw materials which move long distances and as to which the rate bears a high proportion to the price. In his opinion the only real question before the commission is as to whether a reduction in rates would stimulate traffic so as to increase rather than reduce revenues. Naturally, this question is not susceptible of concrete proof, but he contended that all human experience is that a reduction in price induces consumption.

Asked by a commissioner as to the effect of the reductions ordered by the commission in the Southern hardwood lumber

case, Mr. Van Norman said the reduction were not sufficient to move a pound of lumber, but that they have not yet been put into effect. Mr. Van Norman said that the Illinois Central is pursuing a policy of adjusting its local rates to move the traffic, where it can be done without discrimination and without breaking with the other roads, and that last year it made 11 per cent on its invested capital. "If we had in this country 300 railroad executives like C. H. Markham, business would be on its feet in 90 days," he said.

F. B. Dow, representing petroleum interests, quoted from a speech by W. W. Atterbury, saying that if present rates are long continued the railroads will lose traffic by the relocation of industries to points nearer the markets. The petroleum traffic, he said, is getting away from the railroads to pipe lines and water transportation. The total loss of traffic in petroleum to the railroads in 1921 amounted to 21,000,000 barrels. The railroads handled only 6.9 per cent of the crude oil run by refineries. He said it is now possible to move oil from the mid-continent field to the Gulf, around to the Atlantic coast and inland as far as Cleveland by pipeline and water for the amount of the rail rate from Oklahoma to Ohio.

In reply to Commissioner Daniels Mr. Dow said it is unquestionably true that in general crude oil should be transported by pipe lines but there are many situations in which rail transportation should be cheaper. The railroads have recently removed the Ex Parte 74 advance on exports from Kansas, Oklahoma and Texas to the Gulf and, Mr. Dow said, it had resulted in a large increase in traffic and he insisted that further reductions would be beneficial to the railroads as well as to the industry.

Hoke Smith Asks Reduction on Watermelons

Former Senator Hoke Smith of Georgia appeared on behalf of Georgia watermelon growers to urge a reduction in their rates. He said the present rates will check, if they do not destroy, the watermelon business out of Georgia, but if they are lowered to a figure which will leave a profit for the watermelon growers, with the spread of the boll weevil in Georgia, it is probable that this business will largely increase; lowering these rates so as to encourage rather than destroy the business, will be profitable to the railroads as well as to the watermelon growers.

"The transportation charges averaged in the state $55.56 in excess of the gross return per car to the growers," Mr. Smith said. It was shown that the average cost of producing a carload of melons, including the marketing, but not including freight, is $109.75 per carload.

"With the present freight rates the watermelon grower must go out of business. His freight rate, with New York City as the terminal point, from South Georgia points and Middle Georgia points, is between 13½ and 14 mills per ton-mile. Prior to the increase in freight rates in 1918, it was between 8 and 8¼ mills per ton-mile. The rate on watermelons from South and Middle Georgia to New York City, estimated in mills per ton-mile, is more than 25 per cent higher than the rate on iron and steel products from Georgia points to New York City. It is approximately 20 per cent higher than building material to New York City from South Georgia. If permitted to remain, it will kill the business, and stop the freight. While the rate prior to June, 1918, was 8.8 mills per ton-mile, I believe they could stand a rate of 10 mills per ton-mile now. As melons begin to move the latter part of June, and largely move in July, the decreases to save this year's crop from being a loss must take place prior to that time."

Plumb Asks Commission to Avoid Wage Issue

Glenn E. Plumb filed a brief for the "standard" railway labor organizations asking the commission to disregard any evidence and not to enter any orders or findings in any way relating to the justness or reasonableness of the wages. He also asked the commission to reduce its finding of the aggregate value of the railroad property and to reduce the rate of return to some figure below 6 per cent. In reducing the valuation he suggested that the commission use a figure based on the results of the valuation so far established and he presented a calculation based on the tentative valuations by which he arrived at a figure of $13,627,589,375. This calculation was based on the relation of value found to capital account. By another method he reached a figure of $10,806,-000,000. The evidence clearly shows, he said, that the prices now charged for transportation act as an embargo upon transportation and the employees are interested in the restoration of a volume of traffic that will lead to a restoration of the former volume of labor employed.

Security Association Wants Higher Percentage of Return

Forney Johnston, representing the National Association of Owners of Railroad Securities, said the carriers had been conservative in asking that the rate of return be fixed at not less than 6 per cent. He pointed out that the obligation of the commission to prescribe a definite rate of return was entirely distinct from the subsequent obligation of the commission to adjust rates from time to time in the bona fide effort to produce the declared rate of return. In determining the base rate, he urged the commission not to be influenced by the fact that for the time being the return to the carriers on the actual value of their investment is materially below 6 per cent. He stated that whatever ratio might be fixed by the commission as a result of the present inquiry would be likely to endure for several years, as it is beyond the physical capacity of the commission to have repeated prolonged hearings involving changes in the rate of return, and that 6 per cent should not be regarded as an adequate permanent base.

"If accordingly," said Mr. Johnston, "the commission were to feel that in establishing the rate of return its discretion should be influenced by existing adverse conditions, that result would not be accomplished which is clearly contemplated by the statute, that is, the ascertainment and making public of a rate of return which the railroads, regarded as a national system of transportation, are entitled to receive in order to survive on a wholesome basis.

"In like manner, the commission should not regard its obligation to establish this rate of return as if it were sitting as a court to determine the lowest rate of return which would avoid the charge of confiscation."

He also pointed out the difference between the conditions confronting the commission and the conditions which existed when Congress prescribed a rate of return of from 5½ to 6 per cent for the two years transition period, calling attention to the fact that the rate of return intended to prevail during the period immediately following federal control, when the relation of rates to cost of transportation had been entirely destroyed by the rate policy of the administration, was a very different proposition from the declaration of a fair rate of return necessary to sustain transportation in a sound condition after this transition period has passed.

Railway Rebuttal Arguments

Appearing for the Eastern carriers with respect to bituminous coal and coke, W. S. Bronson argued against any reduction being made in the freight rates on coal and asserted that such action would not stimulate traffic.

"Prices of coal, according to witnesses for the coal producers before the commission, have declined approximately $1 a ton in the last year, but that has failed to stimulate buying," said Mr. Bronson. "Why should a smaller reduction in the freight rate on coal bring about a stimulation in the movement of that commodity?"

Mr. Bronson said that with the railroads using approxi-

mately 28 per cent of the coal output of the country, public utilities, 6 per cent, and householders 10 per cent, little stimulation in buying could be anticipated, as it has been shown that the demand from these sources is fairly constant. Substantially all the remainder of the soft coal produced in the United States, he said, is used by industrial concerns, largely manufacturing. The stimulation in traffic resulting from a reduction in the bituminous coal rates, if there should be any, must therefore come from an increased demand by purchasers of manufactured articles," said Mr. Bronson. "Unless the manufacturer elects to translate his reduction in coal rates into a reduction in the selling price of his manufactured articles, reductions in the coal rates cannot stimulate the movement of traffic.

"A large number of witnesses have said that a reduction in the coal freight rates would benefit industries and some have said that it would stimulate business, but not a single manufacturer, so far as the record discloses, has affirmatively stated that he would translate a reduction in his coal freight rates, thereby reducing his costs of manufacture, into a reduction of selling price of his manufactured articles. Neither has anyone explained how in the absence of a reduction in the selling price of the manufactured articles, stimulation in traffic could obtain."

Mr. Bronson said the fact is that the freight charges on bituminous coal represent so small a proportion of the total cost of all manufactured articles that any reasonable coal rate reduction would reduce the cost of manufactured articles too little to reasonably expect such a reduction to be reflected in the selling price of articles manufactured through the use of coal, while it would reduce the carriers' revenues in the Eastern district millions of dollars annually.

H. A. Taylor, of the Erie, replied to the argument of anthracite coal producers, and A. P. Humburg, of the Illinois Central, discussed the coal rates in the West and South. If the large reductions made in the prices of bituminous coal have had no effect in stimulating business, he asked how a reduction in freight rates can be expected to accomplish the same object. "Does a freight rate dollar contain more cents than a dollar of price?" he asked. Commissioner Campbell asked if the point was not that all kinds of business must be readjusted before conditions become normal rather than the direct effect of a reduction as to any commodity.

"But the transportation machine must be permitted to go," said Mr. Humburg.

"The business machine must be permitted to go, too, and the transportation machine cannot go unless the business machine goes," interjected Chairman McChord.

A 50 per cent per ton cut in coal rates would reduce the income of the Southern and Western districts by $50,000,000, Mr. Humburg said, and a 75 per cent cut would reduce the revenues $75,000,000. A reduction in coal rates, he said, would be felt particularly by the roads which handle a large percentage of coal traffic, and some of the same roads have been particularly hit by the reduction on agricultural rates. Chairman McChord asked if the commission should reach the conclusion that reductions can and should be made, what commodities should be selected. Mr. Humburg said he was not prepared to answer that question, but that possibly Mr. Thom would. Chairman McChord said the commission would like to have an answer.

Clyde Brown, of the New York Central, replied to arguments for a reduction of the Pullman surcharge or of passenger fares. He showed that the fluctuations in surcharge revenue have been much less than those in passenger revenue, indicating that this class of travel is less affected by business conditions and pointed out that a reduction of 16 2/3 per cent in passenger fares from 3.6 to 3 cents would amount to $177,000,000. It would require an increase in business of 20 per cent to offset this, he said.

Fred H. Wood replied to some of the criticism of the constructive year exhibits and pointed out that in January, 1922, the roads earned only about 2.6 per cent and the western roads only about 1.2 per cent.

Mr. Thom's Argument

Alfred P. Thom, counsel for the Association of Railway Executives, made the concluding argument for the carriers. He said that the shippers who want their rates reduced should go to the Labor Board, and he asked the commission to find that rates cannot be reduced until operating costs are reduced by a wage reduction.

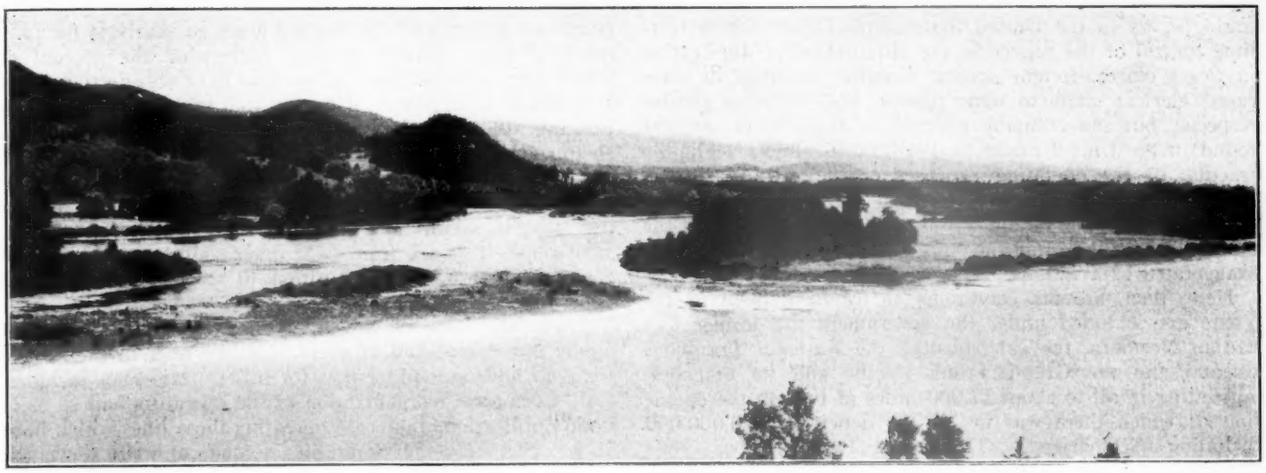
Mr. Thom began by replying to Chairman McChord's question, but said there is difference of opinion among railway officers as to whether any reduction should be general or confined to specific commodities and it would not be proper for him, representing all the carriers, to state an opinion. Mr. Thom argued that the case should be considered not from the standpoint of private interest but that of public interest, in adequate transportation and in enabling the railroads to prepare themselves for a period of prosperity. He pointed out that what has been done for the carriers has not been prompted by a spirit of favoritism to them but because of the public interest involved, and that the Transportation Act was adopted as representing a new policy in an effort to provide an adequate transportation system. The question, therefore, is not whether the railroads should share in the public distress or contribute to other industries but whether the carriers shall be enabled to provide for an expansion of business.

The roads are not now in a condition to buy large quantities of new equipment, he said, but they are trying to reduce the percentage of bad order cars from 15 to 5, which would add 250,000 cars to the available equipment of the country. He said that the evidence before the commission is that a reduction in rates by any reasonable amount would not create the demand which is necessary for a restoration of normal business and that the country is not being held back from normality by the freight rates. The shippers who want lower rates should go to the forum where they could get relief by a reduction in the labor costs of transportation, which are the cause of the present freight rates, but, he said, there had been thinly veiled threats of political results if this case is not decided the way certain advocates would have it decided.

"They think the railroads are the line of least resistance," Mr. Thom said, "yet we know there can be no reduction of rates that will not injure these transportation facilities without a reduction in costs. Why can't this commission say so? Without passing on the level of wages you can say that the cost of producing transportation is the impediment in the way of reductions in rates. If you would do that you would get rid of all your perplexities."

On the other hand, Mr. Thom said, if the commission should reduce rates, and the Labor Board should not reduce wages, it would have a deadly effect on the efficiency of transportation.

In reply to a question by Clifford Thorne as to why we cannot "stop babying the railroads," Mr. Thom said the answer is because they haven't the freedom of other industries. He pointed out that the railroads were excluded from the prosperity felt by industry in general during the war and given no opportunity to set aside for the period of deflation to come, while their wages are fixed by one body and their rates by another. He also replied to Mr. Thorne's comparisons of the yield of railroad and industrial securities, saying that the problem of the railroads is how to raise new capital. "Mr. Thorne has been coming here filing his statistics and making his prophecies as to railroad credit for 10 years," he said. "He has been demonstrated to be an unsafe advisor and the commission has found it necessary to repudiate his advice."



Along the Government Lines in New Brunswick

Problem of Government Railways in Canada

Turning of National Lines Over to Canadian Pacific for Operation Offered as a Solution

By W. T. Jackman,
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WHILE THOSE charged with the operation of the government system placed their main reliance upon a gradually increasing development of traffic over a period of years as the means of reducing and finally wiping out the deficit, the government seemed to lay much stress upon the need of taking over the Grand Trunk and adding it to the other lines if the deficit were to be extinguished. We have already referred to the supposed necessity of thus "rounding out" the government system if it were to be successful in operation, and we have said that this was probably the best reason why the government should take over the Grand Trunk. But when we consult the management of the government system we do not find them enthusiastic as to the good results that might be secured from this inclusion of the Grand Trunk and its co-ordination with the existing organization.

The results of the co-ordination of the Grand Trunk Pacific with the Canadian Northern for operating purposes were described by one of the officials in the following words: ". . . It has been found possible to close a considerable number of stations, freight sheds, and a couple of engine terminals, besides abolishing numerous duplicate offices, the whole resulting in a substantial decrease in the combined cost of operation. . . . It does not seem possible to eliminate any large proportion of mileage in this way." When asked as to the effect of co-ordinating the Grand Trunk with the other government lines, he said: "Unquestionably co-ordination will result in improved service in some places. On the whole it will tend to increase the volume of traffic, lengthen the haul, and effect savings in certain localities."

These expressions from the man who has charge of operation and maintenance do not hold out very great hope that much economy will ensue from the unification of all these railways under a central management. The mere tendency to effect savings in certain places does not give much encouragement that these economies will contribute to any great extent towards the reduction of the $70,000,000 deficit.

But there is one result which should come with the association of the Grand Trunk with the other lines in the government system; that is, there should be on the latter a larger amount than heretofore of the higher class freight from which greater revenue should be received. The Canadian Northern lines in the east touch but few of the manufacturing centres, where high-class traffic is found in abundance; and even at those centres which it did reach the Canadian Pacific and the Grand Trunk had already established themselves before the advent of the Canadian Northern, so that the latter was handicapped in securing a share of this business. But now that the Grand Trunk is linked with the Canadian Northern its better paying traffic will help to augment the revenue of the National System by having commodities carried all the way across the continent on these lines.

There is little reason to doubt, however, that the boasted advantages of Grand Trunk co-ordination, by which the government system was to be transformed from a financially unsuccessful to a financially successful enterprise, are foredoomed to defective, if even partial, realization. Those persons and places which are on the existing lines of railway will certainly oppose any effort on the part of the management to reduce the character of the service; on the contrary, people are keenly desirous of having the quality of the service improved, and any effort to take off certain trains or to curtail in any other way the facilities for shipment or travel would meet with immediate antagonism.

Had such co-ordination been carried out before the great series of lines were laid down it could have been effective; but when once the network has been completed and the service established on a certain scale, so that businesses located along the line expect the continuation of that service which induced them to establish their plants there in the first place, it would be highly derogatory in many instances to the welfare of the railway, as well as of the country, to permit any significant change in the character of that service. Of course, there

*This is the second of two articles on this subject, the first having appeared in the *Railway Age* of March 11, page 567.

could be, as in the United States during government war-time control of the railroads, the elimination of duplication in ticket offices, freight agents, terminal facilities in some cases, clerical staffs to some degree, and in other similar respects; but the economy effected in these ways, as was found in the United States in 1918, is an almost negligible fraction of the operating expenses of the railway system. It is certain that those who anticipate large savings through co-ordination of the Grand Trunk with the other parts of the national system will find the outcome not in accord with their exaggerated expectations.

Here, then, are the conditions as we have them today: There are included under the government the former Canadian Northern, the Intercolonial, the National Transcontinental and the Grand Trunk Pacific and its branches, amounting in all to about 17,000 miles of line, in the operation of which there was in 1920 a deficit of $70,000,000 including fixed charges. The Grand Trunk Railway System of over 5,300 miles, which in 1920 paid its operating expenses but fell short of meeting its fixed charges by $6,563,091.33, has now been added to those just mentioned, so that now there is well over 22,000 miles under government ownership. The different units of this aggregation show each a deficit, as follows:

Canadian Northern:		
Deficit in operation	$16,258,579.80	
Fixed charges:		
Due the public	13,837,118.51	
Interest due government	10,318,869.97	$40,414,568.28
Canadian Government Railways (including National Transcontinental, Intercolonial, Prince Edward Island, and a number of shorter railways). Deficit in operation		10,449,876.43
Grand Trunk Pacific:		
Deficit in operation	$10,134,513.94	
Fixed charges:		
Due the public	6,048,950.60	
Interest due government	2,475,474.00	
Interest on receiver's certificates for 1920	808,351.63	19,467,290.17
		$70,331,734.88
Grand Trunk Railway:		
Due on fixed charges		6,563,091.88

Under these conditions, it seems almost inevitable that when these properties are combined and operated under one management there should still be a deficit; in fact, it is anticipated that the deficit for the next year will be at least $100,000,000. To continue to pile up such additions to the taxpayers' burdens year after year is nothing short of a crime. The government has persisted in saying that in nationalizing the railways it was carrying out the will of the people, although it never gave the people any opportunity of expressing their wish regarding this issue. Even when the parliamentary committee was appointed in the spring of the present year to inquire into the problem of the National Railways the scope of the inquiry was so circumscribed as to render the work of the committee practically useless.

What is the Remedy?

What is the best way to deal with these financially embarrassed railways, now that they have been grouped under government ownership? It seems as if the only conclusion reached by the government is to let them alone, in the hope that the progress of immigration and the upbuilding of the country may ultimately enable them to pay their way, and in the meantime let the people pay the mounting deficits. At the time of great prosperity, the people sanctioned the construction of railways for the opening up of the great west, and gave largely in the way of national assistance for this purpose. But because people could not foresee the war and the economic depression which has accompanied and followed it is no reason for saying, now, "Let the people pay the price of their undue optimism." Such a fatalistic method of dealing with the problem is not in accordance with the spirit of a progressive people.

The government has virtually acknowledged that it has no other than the existing policy, namely, to drift along and let enormous amounts of the people's taxes go yearly to the payment of these railway deficits, concerning the accrual of which they have not been allowed to have an effective voice. It is not to be expected, of course, that the government, after pushing its nationalization policy to the present extreme, should acknowledge that this policy has been disastrous. It has reiterated that its railway policy was the only one that was possible under the circumstances, and we could not expect that it would now admit its error. Relief, therefore, must come, if at all, from some other source, for the present government shows no disposition to reconsider the scheme upon which it has embarked.

There are some who really believe in the principle of public ownership, and of these only one man in public life seems to have any suggestion for relief. His plan includes, first, a complete reorganization of the operating end so as to avoid duplication, and cease operating those lines which have no prospect of being profitable; second, to write down the assets to their proper value; and, third, to encourage a sound policy of immigration, which shall place men on the land and thus develop business for the railways. As to the first, there is no question that duplication of facilities has been a great waste. When the railway lines which were formerly in competition are brought under one control, many trains may be taken off which were formerly run unprofitably; there may be considerable saving of capital and expenditures in the matter of terminals; there may be the reduction of some of the expenses of maintenance of way and structures and the number of higher officials in the service may be reduced. In these and other ways there might be economies of operation and maintenance which would be important.

Yet even here there is likely to be exaggeration as to the amount which can be saved. On lines which have been in operation for many years people become accustomed to a certain quality of service and any curtailment of this would be, as in some cases it has been, strongly opposed. The amount spent for maintenance of way and structures will be almost as much whether one train or three or four trains per day pass along the line. The number of officials to take care of a large traffic is little, if any, more than the number required for a smaller traffic, because the work of each is specialized. It is very easy to overestimate the amount which can be saved through the avoidance of duplication. Moreover, to cease operating those lines which have no prospect of paying seems at first thought the part of wisdom. But we must remember that very few such lines have been constructed, especially by private capital; they may have had little traffic at first but the prospect of better things has been the inducement which led to the construction of railways into new territory, and the development of new areas. We venture to say that the mileage built that had no prospect of being profitable is very small.

As to the second measure of relief, namely, to write down the assets to a proper point, very little can be said in favor of this. It is true that when a merchant has goods on his shelves that he cannot sell, his bank will insist upon his writing down his assets below their book value in order to present a clear statement of where he stands. But this is not comparable at all with the railway for the latter does not sell its service according to cost. It charges what the traffic will bear. Moreover, it would be useless for the railway to write down the value of its assets, for its financial standing is not determined by this means, but rather by the amount and regularity of its income. There is not necessarily any direct connection between the amount of the assets and the amount of the income; for some roads with a small amount of rolling stock regularly employed have a larger and more uniform income than other roads with a much larger amount of physical assets.

The contention, then, that the assets of these railways under government ownership should be reduced to a proper

point has absolutely no bearing upon the problem of the railway deficits. What is needed is, not the writing down of the value of the assets, but the reduction of the fixed charges and operating expenses to the lowest minimum and the increase of the earnings to the greatest possible extent.

As to the third phase of this proposed change, namely, the pursuit of a wise policy of immigration and the proper distribution of the immigrants so as to augment the amount of farm produce available for carriage by the railways, nothing in the way of criticism can be directed against this significant suggestion. Far too much of the immigrant tide has flowed into the cities and towns of this country and has engaged in occupations which furnish but little traffic to the railways. The country development has been delayed by not attracting to the land those whose interests in their former homes have been mainly agricultural; and a more enlightened policy should be pursued for the opening up of the great areas in the west and north that are capable of yielding, not only good homes to the settlers, but abundance of produce for rail shipments. Even if the government were to pursue this plan, it would be a long time before there could be much increase of traffic as a result of its adoption, and during that time there would be the expenditure of many hundreds of millions of dollars of the people's money to pay the vast deficits which are accumulating at such an alarming rate. This policy, therefore, does not seem to offer the best solution of the railway entanglement.

One Possible Solution

In what direction may we most hopefully look for relief? In ordinary business, it a large concern faces insolvency, there are two courses open by which its affairs may be adjusted. If it is a new corporation, which is just seeking to establish its place in the business world, it is usually allowed to go into bankruptcy and then its affairs are closed up. But if it is an old-established firm, which has worked its way into the public esteem and which, if it were to go into bankruptcy, would cause a shattering of public confidence, it is frequently saved by a stronger firm coming to its rescue. This is recognized as a good principle in the case of banks, and the example of the Ontario Bank, which was taken over by the Bank of Montreal, is within the memory of many today. Many instances of the same kind could be cited in the history of the United States. The combination movement in industry shows a great variety of illustrations of the same procedure, by which concerns which were almost "on the rocks" have been taken over and their managements merged with those of stronger businesses. This would seem to point the way to the most appropriate solution of the railway problem, which I now desire to present.

Briefly, if we desire operating efficiency for the government-owned roads, the best way by which to secure it would be to link them with the Canadian Pacific. The interests of all are identical; the private road is subject to the same conditions as to rates, service and regulation as the government roads, but the private road has obtained an enviable position as the largest and most successful corporation in the railway world. It would, therefore, be a tower of strength to those roads which are now in such desperate financial need.

Fortunately, Lord Shaughnessy, the chairman of the Canadian Pacific directorate, has already presented a personal memorandum to the government upon this subject, and has shown that by having the government roads operated under the Canadian Pacific management the deficit of the national lines would be reduced at once to eleven or twelve millions per annum. By this country, which has an enormous debt and faces a deficit of perhaps a hundred millions in the operation of its railways during the present year, such a safe proposal, which would reduce this railway deficit to one-eighth of its great aggregate, should be welcomed eagerly.

The removal of this railway incubus from the country and the freeing of the people from the burden of such vast anticipated annual contributions for no productive purpose is a consummation which should be effected as speedily as possible. Of course, it is not in the interests of the Canadian Pacific stockholders that their company should align itself along with a combination of decrepit railways such as those owned by the government, for the resources of the Canadian Pacific and the company's great future under its present management are clearly indicative of still better things for the stockholders. By undertaking to carry along the government roads, the Canadian Pacific would really be sacrificing its own best interest in order to assist in a great work of national rehabilitation by gradually placing these almost derelict railways upon a sound basis, through bringing its own financial resources and its unparalleled organization to contribute to their restoration.

As was suggested by Lord Shaughnessy, if as a result of negotiations between the government and the Canadian Pacific some plan were finally drawn up by which the latter would operate the national lines in conjunction with its own, the government becoming responsible for the amount of the deficit which still remained in the operation of its roads, but which would decrease from year to year, the arrangement would have to assume much of the aspect of permanence. The railway business is one which cannot prosper except under a policy which has all the elements of continuity. Its expenditures, many of them, must be made a long time in advance, so as to prepare for the increasing volume of traffic which frequently comes with unexpected suddenness. A hand-to-mouth existence is impossible for a railway which would serve the country effectively.

So that if the Canadian Pacific were to undertake the operation of the public railways the contract would have to be drawn up in such a way as to permit policies once inaugurated to be carried into effect over a protracted period. Of course it would not be necessary to have an absolutely perpetual arrangement, but one which would have such a degree of perpetuity as would assure the Canadian Pacific that when it embarked upon a policy of building up the assets and the earning power of the other roads it would be enabled to secure some reasonable compensation for this service.

A contract entered into for a period of, say, 99 years would have all the elements of continuity which would be requisite. But, instead of having one fixed financial arrangement for that entire period, there should be the possibility of some measure of elasticity. It is recognized now by those who know best the operating conditions of the government roads that it would take at least 15 to 20 of the most prosperous years that Canada has known before the national lines will be in a position to meet all their expenses.

If, therefore, an agreement were entered into now upon terms that would be satisfactory to both parties, it would be advisable to have the contract such that if at the end of, say, 20 years the earnings of the national lines should exceed a certain amount, due partly to the general development of the country and partly to the efficient management of the Canadian Pacific, there might be a new financial adjustment, so that while the company was allowed adequate compensation for its risk and management the public would also secure a fair share of the results which accrued from the growth of population and the expansion of the country's business. These periods of reconsideration of the finances of the combined systems should take place thereafter at regular intervals of perhaps 10, 15 or 20 years, so that the entire arrangement might have some of the spirit of a partnership for the public welfare.

Under these conditions, where monopoly would be substituted for partial competition, our regulative system would have to be adjusted accordingly. Some of the sources of trouble which now exist would even then call for the exercise of the same authority by the Board of Railway Commis-

sioners; and, on the other hand, not a few of the cases which now come before the board would disappear from the docket of that body. In certain respects the regulation of a monopoly of railway transportation would be more easily effected than when there are several railways operating in the same territory, and among other things there would have to be greater publicity of accounts so as to acquaint the public with the facts.

By securing the assistance of the best men in railway economics, railway law and railway management, the government would soon be able to devise a system of regulation which would be equitable and would safeguard the public interests; and as a result of this new system of control there would be the infusion of a new life into the entire railway organization. It would be highly desirable, since the Canadian Pacific would have the management of not only its own property but that of the people of Canada, that a majority of its stock should be held in this country; otherwise we might have the possibility of groups of foreign shareholders getting an undue share in the election of directors of the company and in this way we should have foreign control of the property belonging to the Canadian people.

There are still some people who cling to the hope that as the country grows up to the measure of its transportation facilities the railways owned by the government will prove a profitable enterprise. To cherish such a hope is to live in a world of delusion. A director of the National System recently declared that if the "right men" were chosen to manage this system they would do it "just as well as if they were looking after their own business." To make such a statement as this is to display great ignorance of human nature or else to confess that the "right men" are seldom found.

The facts of experience of state railways in other countries are irrefutable and human nature and human motives are no different in Canada from what they are elsewhere. At the risk of repetition, I venture to give the words of Mr. Acworth before a committee in Washington in 1917: ". . . that it is impossible to procure, under any system of state management in a democratic state that has yet existed, an authority that is left to consider impartially, undisturbed by political influences, the interests of the whole public as distinguished from the particular or local interest of certain places or certain trades. I think that is really the sum of the evidence . . . all the evidence is that in a democratic state the interference with the impartiality of management in the interest of the whole community, the intrusion of unjustifiable demands on behalf of certain favored individuals or favored localities or favored trade interests has never been prevented."

These are the conclusions of one who today stands without a peer in regard to his knowledge of the results of railway operation both under government and private ownership; and he states without any equivocation that government ownership invarably means favoritism rather than impartiality of operation in the public interest.

Will the people of Canada learn the lesson before that stage has been reached when stagnation of enterprise must materialize? Or, will they seek the best means by which these government-owned railways may be transferred to private control and individual initiative under conditions which will make for the continuous upbuilding of a transportation mechanism responsive to the requirements of a young and progressive country? The demands during the recent (1921) session of the House for information regarding the government railways is but a forecast that in future more complete information will have to be given to the public, and it is evident that the people's representatives in parliament will secure greater and greater control over these railways when they must vote such large amounts to pay for the present deficits.

These circumstances clearly indicate that if the roads are retained by the government there will be a more direct interference by parliament in their management. This would lead to the same unfortunate conditions as in the case of the Intercolonial. We are firmly convinced that the present distressing system of management cannot long be endured, nor is it capable of much, if any, improvement so long as the policy of government ownership is continued.

A Peculiar Rail Failure

SOMETIME ago trackmen on a western road noticed a peculiar mark on the gage side of the head of a rail in service, indicative of the presence of a horizontal or perhaps a compound internal fissure. The rail was removed from track and broken to see what internal condition existed. Not only was a compound internal fissure definitely located but in addition the rail was found to be badly piped and the fracture also showed signs of its being badly segregated. The rail was sent to Robert W. Hunt & Co., Chicago, for examination, to whom we are indebted for the photographs and the following data. One of these pictures shows a side view of a piece of the rail about 8 in. long as it was broken after having been removed from the track, while another picture shows the left-hand view of the cross section of this piece and reveals a compound internal fissure, which it will also be seen extends horizontally in the head. Another picture shows the results of a strong acid etching of the right-hand end section about 8 in. from the fissure, revealing the pipe plainly as well as evidences of unsoundness.

Sections Showing (at Left) Compound Fissure in Head and Fine Grained Structure, Indicating Segregation; (in Center) Crack Indicating Compound Fissure and (at Right) a Pipe

The chemical composition of drillings taken from a location adjacent to the above etching was as follows, the mill analysis of the heat also being shown for comparison:

			Analysis of Sample	
	Specified	Mill Ladle Test Analysis	Corner of head	Junction of head and web
Carbon	.62—.75	.72	.74	.87
Manganese	.60—.90	.73	.73	.75
Phosphorus	Not over .04	.029	.024	.034
Sulphur	.....	.038	.033	.043
Silicon	Not less than .10	.25	.27	.27

It will be noticed that the silicon content of the heat is fairly high, which fact is confirmed by the analysis of the

broken rail. This fact alone, however, did not prevent the rail from being badly segregated, a condition which may have contributed to the formation of the internal fissure, though to what extent is, of course, problematical. This was an "A" or top rail of an ingot and had been in service approximately three years.

The drop test pieces cut from the top end of three "A" rails were all satisfactory. Two of them successfully withstood one blow of the top falling from a height of 17 ft., and gave an elongation of seven per cent and five per cent in two inches, when tested base up. The fractures of the three pieces were satisfactory and all rails were accepted.

Employees Question Legality of Wage Conferences

B. M. Jewell Charges Roads Are Not Properly Before Labor Board —Burlington Clerks Agree to Cut

BEFORE ENTERING into the discussion of what constitutes just and reasonable wage scales under present conditions, representatives of the various organizations now before the Railroad Labor Board to fight proposed reductions in wages will attempt to prove that many of the carriers involved in this controversy are not properly before the Board because the negotiations preceding the submission of the various disputes to the Board were not brought about in compliance with the provisions of the Transportation Act and the orders of the Labor Board. This offensive defense was disclosed when hearings in the controversy were resumed on March 13, following a recess of two days. B. M. Jewell, president of the Railway Employees Department of the American Federation of Labor, in opening his presentation on behalf of the Federated Shop Crafts, gave notice of his intention to attempt to prove by correspondence and the testimony of general chairmen on various carriers, that the manner in which the joint conferences required by the Transportation Act were announced and held was not in compliance with the law and that therefore disputes over wage reductions are not at the present time properly before the Railroad Labor Board.

The case of the Wabash was first taken up, Mr. Jewell reading correspondence between representatives of the Federated Shop Crafts on that road and the management. He drew from this correspondence the inference that proper notice of the conferences required by the law was not given to the employees involved and that in fact bona-fide conferences on the subject of just and reasonable wages, taking into consideration the seven relevant factors enumerated in the Transportation Act, were not held. Representatives of the carriers told of the progress of the wage reduction movement, the negotiations on this subject, the manner and time in which they were held, the testimony indicating that all of the procedure prior to the submission of the dispute to the Labor Board was in compliance with the Transportation Act.

J. W. Higgins, executive secretary of the Association of Western Railways, in defending the manner in which the Wabash had called and handled conferences with the representatives of the Federated Shop Crafts, characterized the delay brought about by representatives of the employees as the only irregularity in the procedure. "Delay" he characterized as the "strategy" of the employees in this case.

The objections of the labor leaders voiced at this session seemed to be based largely on technical grounds; maintaining that the failure of the carrier to go into detail as to their proposals, the arguments therefor and the arrangements for conferences constituted a violation of the procedure outlined in the Act.

Representatives of the carriers, in reply, contended that these charges were groundless, the result being a large amount of quibbling as to duties and responsibilities of both carriers and employees in initiating wage increase or decrease movements. A similar discussion involving the Missouri Pacific, the Chicago, Milwaukee & St. Paul, and the Pere Marquette followed, with practically the same result in each case.

Mr. Jewell Requests Analysis of Railroad Propaganda

Before going into this phase of the controversy, Mr. Jewell requested that the Board and the members thereof, make the necessary arrangements to examine their own and the Board's files "to determine the amount of communication, publications, pamphlets, etc., that have been received by the Board and members" to "ascertain the amount of propaganda, the amount of publications or 'yellow sheets' that have been received from the Association of Railway Executives, giving the number and date of the first one, and the number of the last pamphlet and the date it was received; the general contents and make-up of these." He also requested a similar investigation of material received from "interests or parties or organizations other than either railroad managements or organizations or railroad employees' organizations." This information was desired, he said, to ascertain whether these organizations "are familiar with or interested in or affected by or clearly understand, except as somebody indicates to them, railroad labor and management problems." At the same time he also asked that an investigation be made of similar material received from labor organizations other than those of railroad employees.

Board Rules Out Testimony on Contract Work

The second attempt by the labor leaders to bar a number of railroads from the wage hearing failed when B. W. Hooper, vice-chairman of the Board, ruled against the introduction of evidence by representatives of the employees purporting to show that the roads in question have violated the law by contracting shop work to outside firms. Mr. Hooper's ruling developed the fact that the Board will soon render its decisions in cases of this character involving the Erie, the Indiana Harbor Belt and the New York Central, who have been charged with violation of the Transportation Act by contracting shop work to outside firms and whose cases are now pending before the Board. The ruling against evidence on this subject was predicated on the fact that the whole question is now before the Board and therefor should not be argued in connection with wage reduction pleas. The question at issue, Mr. Hooper said, was one of the most important the Board has faced and added that if such contract work was declared legal "the ground would be cut out from under this Board and the vitals of the Transportation Act would be killed."

The ruling was made over the vigorous protest of Mr. Jewell, who asserted that if railroad shops were to be closed one day and opened by a contractor at lower wages the next, the railroads were setting an example which might convince the employees that "the very small number we have termed

radicals were right and the great majority of sane-minded employees is 100 per cent wrong."

Estimates of Savings Requested by Board

The Labor Board, through representatives of the western, eastern, and southeastern carriers, has requested that a compilation be made showing what the annual saving would be if the present requests of the carriers for wage decreases were granted by the Board. This request is the outgrowth of a previous discussion between A. O. Wharton, labor member on the Board, and Mr. Higgins, as to the savings which might be passed on to the public in the form of lower freight and passenger rates.

Additional Testimony Presented by Several Carriers

The Board's session on March 8 was taken up with the presentation of evidence by various railroad officers in western territory who had acted as chairmen of state or city committees which gathered information as to the rates of pay, overtime provisions and hours of service of employees in other industries performing work comparable to that performed by railway shop employees. In addition, L. W. Baldwin, vice-president of the Illinois Central, G. S. Waid, vice-president and general manager of the Southern Pacific, Lines in Texas and Louisiana, and W. E. Williams, assistant to the chief operating officer of the Missouri, Kansas & Texas, presented short statements on behalf of their roads, pointing out conditions peculiar to the carriers in question and amplifying the testimony already presented on behalf of all western railroads by Mr. Higgins.

The "ability of the carrier to pay" again bobbed up before the Board at this session when B. W. Proctor, assistant general manager of the International & Great Northern, E. E. Nash, vice-president and general manager of the Minneapolis & St. Louis, W. H. Gemmell, president of the Minnesota & International, S. M. Russell, receiver of the Toledo, Peoria & Western, and B. A. Worthington, president of the Cincinnati, Indianapolis & Western, in separate presentations called attention to the financial condition of their roads and the necessity for consideration of their wage problems with this particular phase in mind.

W. A. Northcutt Appears on Behalf of Southeastern Roads

W. A. Northcutt, general solicitor of the Louisville & Nashville, appeared before the Board on March 10, on behalf of the southeastern carriers filing exhibits dealing with revenues, expenses and railway operating income, employees and their compensation and the wage proposals of the southeastern roads. Mr. Northcutt briefly outlined the financial condition of the southeastern roads in general and cited the increases in labor costs on various carriers which he characterized as "the main cause for the deplorable condition" of those carriers to whom Herbert Hoover recently referred in his testimony before the Interstate Commerce Commission when he said, "in surveying the situation by districts we find that the whole of Class 1, southern roads, barely earned enough money to cover the interest on their bonds * * in spite of the fact that maintenance of the property had been held during that period to a low level."

After analyzing the increases in wage rates and the relation of these wage increases to increases in the cost of living, Mr. Northcutt added, "while the rate for machinists is now 77 cents per hour and we are proposing a split rate of 66 and 63 cents, outside industries in the territory served by the Atlantic Coast Line are paying a weighted average rate of 62.2 cents per hour; the Chesapeake & Ohio, 60.4 cents per hour, the Louisville & Nashville, 58.6 cents per hour, the Nashville, Chattanooga & St. Louis, 66.2 cents per hour, the Seaboard Air Line, 62.3 cents per hour and the Norfolk & Western, 39 cents per hour. Similarly Mr. Northcutt showed that whereas the southeastern roads are paying boiler makers, blacksmiths, sheet metal and electrical workers, 77 cents per hour, the rate for employees performing analogous work in other industries along the southeastern lines are receiving rates ranging from 48 to 67½ cents per hour.

The testimony presented by Mr. Jewell during the remainder of the week was devoted wholly to an attempt to prove that the negotiations preceding the submission of this controversy to the Board were perfunctory and not in compliance with the terms of the Transportation Act. A great deal of time was taken up with the reading of transcripts of conferences held between representatives of the carriers and their employees and upon being questioned by the Board as to how much longer the presentation of testimony of this character would take Mr. Jewell indicated that it was his desire to offer proof of similar charges against practically all carriers parties to the dispute.

Clerical Forces on C. B. & Q. Agree to Wage Cut

Clerical employees of the Chicago, Burlington & Quincy have agreed to wage decreases averaging about six or seven per cent, according to a recent announcement. The lower rates of pay were effective on February 1 and are to remain in effect for at least one year. Although the agreement was reached in the latter part of January, it was not announced until recently. Its provisions may be summarized as follows:

The rates of pay for clerks and clerical supervisory forces are reduced to "a rate equal to $39.28 over the rate received in December, 1917, for all those who were receiving $62.50 or less in that month, except (a) that station baggagemen and mail handlers * * will not be reduced below $67.50 per month, and (b) that baggage and mail truckers at Lincoln, Omaha, Union Pacific Transfer, Quincy and Galesburg who received less than $62.50 per month in December, 1917, will not be reduced below $93.62." For the group of employees designated as "train and engine crew callers, assistant station masters, train announcers, gatemen, and baggage and parcel room employees" the same ruling applies except that the new rate is equal to $31.12 over the rate received in December, 1917, etc. Furthermore an adjustment "equivalent to a saving of one per cent per hour is made on all of the positions enumerated above such adjustment to be distributed by mutual agreement; piece work rates to be adjusted in proportion."

A reduction of seven cents per hour is provided for employees listed as "janitors, elevator and telephone switchboard operators, office, station and warehouse watchmen and employees engaged in assorting way bills and tickets, operating appliances or machines for perforating, addressing envelopes, numbering claims and other papers, gathering or distributing mail, adjusting cylinders and other similar work, * * office boys, messengers, chore boys and other employees, under 18 years of age, filling similar positions and station attendants."

Freight handlers and truckers and others similarly employed, upon entering the service, are to be started at "a minimum of 35 cents per hour and increased two cents per hour after each six months of continuous service until they receive rates of pay five cents per hour less than those now existing, except where reduction of five cents per hour would make them less than 35, the 35 cent rate shall obtain continuously. Piece work rates are to be adjusted in proportion."

The differential of one cent per hour between rates of pay of sealers, scalers and fruit and perishable inspectors and of two cents per hour between the rates of pay of stowers or stevedores, callers and loaders, locators and coopers and the rates of pay of truckers are continued "provided that those hereafter entering such positions will receive the respective differentials over the present truckers' rate reduced by five cents, except that if a trucker now in service and

not affected by such five cent decrease be promoted to a position (such as sealer, etc.) the differential over his present rate will be applied."

The employees named in the last two paragraphs "will be considered in service and not affected by the rate change, who have been laid off in reduction of forces * * *."

The rates of pay of all common laborers in and around stations, storehouses and warehouses are adjusted to conform to the "going rate" in the locality employed with a minimum rate of 30 cents per hour. The piece work rates of these employees are adjusted in proportion.

"New positions since December, 1917 or positions not now filled but which may be refilled when forces are enlarged as business picks up will be rated in conformity with the adjusted rates for positions of similar scope and responsibility. The foregoing contemplates the abandonment of the rates established for certain years of experience; and hereafter fixing rates for positions."

The Burlington did not apply to the Labor Board for decreases in the wages of clerical forces. Other western carriers have asked for reductions running from 10 to 15 per cent and for a reduction of the war time minimum from $87.50 to $73.22.

Insofar as the carrier is concerned the effect of this decision will be to permit of savings immediately instead of after extended hearings and a ruling by the Labor Board. Insofar as the employees involved are concerned it will eliminate the chances of a heavier cut by the Board.

Buffalo & Susquehanna Cited to Appear Before Board

A. M. Darlow, general manager of the Buffalo & Susquehanna, was cited by the Board to appear on March 14 to answer charges made by E. J. Manion, president of the Order of Railroad Telegraphers, to the effect that the Board's wage decisions have been violated by that carrier. The Buffalo & Susquehanna, Mr. Manion charged, defied the Board and cut the wages of operators and station agents, threatening the men with the loss of their positions unless they signed agreements to the reductions. Most of the men, Mr. Manion said, signed and later repudiated the agreements and refused to accept the reductions.

Commission Sustains Short Line Interpretation of "Deficit"

WASHINGTON, D. C.

THE INTERSTATE COMMERCE COMMISSION has issued a decision construing the word "deficit" as used in paragraph a of Section 204 of the Transportation Act, which provides for the reimbursement of the short lines for losses sustained during that part of the federal control period after they were relinquished by the Railroad Administration and were privately operated, to mean, "a deficiency or decrease in a carrier's railway operating income for that portion of the control period during which it operated its own railroad as compared with its average railway operating income for the corresponding portions of the test period."

Commissioners Meyer, Hall, Aitchison and Eastman dissented, on the ground that the word "deficit" has a very definite meaning which does not support the finding of the majority decision.

Paragraph c of Section 204 provided that as soon as practicable after March 1, 1920, the Commission should ascertain for every carrier, for every month of the federal control period during which its railroad was not under federal operation, its railway operating deficit, or its railway operating income and the average of its railway operating deficit or of its railway operating income for the three corresponding months of the test period; it being further provided that these "control returns" and "test returns" should be used as bases for computing the amounts payable to the carriers. Pursuant to this requirement the Commission issued, on March 4, 1920, an order requiring the carriers to report the data deemed necessary in ascertaining these "returns." In this order it announced, in effect, that carriers which did not sustain a railway operating deficit for that portion of the federal control period during which they were privately operated were not covered by Section 204.

This announcement, the Commission now says, was made out of abundant caution at a time when it had had no opportunity to give to the section, especially to paragraph a thereof, the critical and mature consideration essential to its correct interpretation. Notwithstanding this announcement, various carriers whose railway properties were privately operated during a portion of the federal control period, and which, for such period of private operation as a whole, had railway operating incomes, but smaller incomes than their average incomes for corresponding portions of the test period, presented to it requests for certification of payments under Section 204. As it was still in doubt as to the proper construction of this section, these requests were informally denied. Thereupon these carriers asked for a hearing, which was held on November 4, 1921.

The Commission says in its report:

In paragraph a the term "carrier" is declared to mean a carrier which, among other things, "sustained a deficit in its railway operating income for that portion (as a whole) of the period of federal control during which it operated its own railroad or system of transportation." The phrase "deficit in its railway operating income," in that definition, is not employed by accountants. In the system of accounts prescribed by us, the phrase "railway operating deficit" is employed in a sense antithetical to "railway operating income," and, thus used, means an excess of operating expenses and taxes over operating revenues. It is apparent that the phrase, if employed to express the same idea, is an inaccurate use of words, which are self-contradictory. There is no doubt, however, that this phrase, "deficit in railway operating income," is used in paragraphs b, c and f to express an excess of railway operating expenses over railway operating revenues in one period without reference to another period, just as in paragraphs d and e the world "deficit" is used in the same sense. If this meaning be given to the phrase "deficit in railway operating income," as used in paragraph a the effect is to limit the benefits of Section 204 to those carriers which sustained railway operating deficits for that portion of the federal control period during which they were privately operated. The protestants contend that this construction results in injustice and unfair discrimination, in that it excludes from the benefits of the section those carriers which had a net income for that portion of the federal control period during which they were privately operated, although they may have suffered substantial decreases in income as compared with their incomes in the test period. They insist that Congress could not have intended such an inequitable result. And they point out that paragraph a may be harmonized with the remainder of the section by construing the phrase "deficit in railway operating income" to mean a deficiency or decrease in railway operating income, as compared with the average income for the corresponding portions of the test period.

The basic principle which underlies all rules of statutory construction is that the purpose, the intent of the lawmaker constitutes the law.

If the word "deficit" is construed as a deficiency or decrease in income under private operation in the federal control period as compared with the income during the test period, the definition of "carrier" is completely harmonized with both the letter and spirit of the remaining paragraphs of the section. If, however, this word is given its technical meaning as used by accountants, the effect is to make the right to reimbursement contingent upon the carrier's having sustained a technical or absolute deficit while privately operated in the federal control period, a result which is in direct conflict with the plan of reimbursement set forth in detail in the section. The rule is thoroughly established that if a word or phrase is susceptible of two constructions, one of which will effectuate the evident purpose of the statute and one of which is inconsistent or in conflict with that purpose, the former must control. We are, therefore, unable to resist the conclusion that, in the definition of "carrier" in paragraph a, Congress meant those carriers which sustained losses in income under private operation in the federal control period as compared with the test period.

The idea that Congress, in the definition of "carrier," intended

those carriers only which sustained actual deficits under private operation in the federal control period, is not only in direct conflict with the plan of reimbursement detailed in the remaining paragraphs of the section but it is negatived by the fact that such a classification of carriers would be purely arbitrary and wholly unsupported by any sound reason. The purpose of the section is to reimburse carriers for losses sustained because of federal control. It is obvious that a carrier which had a net income under private operation in the federal control period may have sustained a loss by reason of federal control equal to or greater than that of a carrier which sustained a deficit during such period of private operation. And there is nothing in the circumstances surrounding these carriers which raises any presumption that those which sustained actual deficits were more necessitous than those which had net incomes. Moreover, such a classification leads to results which are so inequitable as to be absurd.

Commissioner Meyer, in his dissenting opinion, said that the holding of the majority, in his opinion, contemplates the payment of a large sum to the short line railroads without warrant of law, through the disregard of what was intended to be an important condition limiting the benefits of that section to carriers of a particular class. The effect of the majority opinion, he said, is to treat that portion of the definition of "carrier" under discussion as surplusage; for the process of computation detailed in paragraphs c, d, e, culminating in paragraph f, would in itself result in reimbursing all of the short lines in the amount of their *decrease* in income as compared with the test period income.

The word "deficit," he said, is one of frequent use in accounting, and when used in connection with railway earnings has become so common as to have passed from the class of technical accounting terms. It occurs many times in the reports of the proceedings in Congress and before its committees prior to the passage of the transportation act. The word "deficit" is used 13 additional times in Section 204, and is also used in Section 209, and in all of these instances it is admitted that it has no reference to a comparison of the income for one period with that of another. It thus appears, he said, that the application of the word in paragraph (a) of Section 204, as contended for by the short lines and accepted by the majority, is without precedent or parallel.

"The majority report," Commissioner Meyer said, "appears to be animated by a belief that hardship will be suffered by certain short lines if we adhere to the interpretation twice placed by us upon this section. But, if true, this would not justify us in extending the benefits conferred by Section 204 beyond the limits placed upon them by Congress. It is our function to administer the law, not to make it. If Congress had intended to extend the terms of Section 204 to all short line roads, rather than to the more necessitous of such roads, appropriate language would have been used. If our former interpretation is incorrect, the courts could have rectified our error in an appropriate case; and, if correct, the remedy of the carriers, if any, is an appeal to Congress for an amendment of the law."

Freight Car Loading

WASHINGTON, D. C.

THE NUMBER of cars loaded with revenue freight during the week ended March 4 exceeded the 800,000 mark for the first time since the first part of November and showed a large increase as compared with the corresponding week of last year while nearly reaching the figure for 1920. The total was 803,255, as compared with 711,367 in 1921 and 811,106 in 1920. This was also 68,000 more than for the previous week which included a holiday. Gains as compared with last year were shown in the loading of all classes of commodities except livestock, forest products and ore, and in all districts except the southwestern. While much of the increase was in coal, large increases were also shown in grain, merchandise and miscellaneous. The summary follows:

REVENUE FREIGHT LOADED AND RECEIVED FROM CONNECTIONS

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, MARCH 4, 1922

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L.C.L.	Miscellaneous	Total revenue freight loaded: This year, 1922	Total revenue freight loaded: Corresponding year, 1921	Total revenue freight loaded: Corresponding year, 1920
Eastern	1922	10,154	2,560	51,565	2,0 8	4,984	780	65,664	65,900	203,615	.....	.....
	1921	6,566	2,617	42,117	918	7,422	668	52,244	55,957	.....	168,509	192,061
Allegheny	1922	3,159	2,571	55,302	3,859	2,327	1,399	50,032	52,560	171,209	.....	.....
	1921	2,093	2,578	43,307	4,446	2,397	1,918	38,053	45,054	.....	139,846	168,226
Pocahontas	1922	266	60	25,579	241	1,100	9	5,954	3,553	36,762	.....	.....
	1921	180	90	13,995	199	1,352	36	4,773	2,884	.....	23,509	25,540
Southern	1922	4,319	2,320	26,046	493	15,261	463	37,484	38,003	124,389	.....	.....
	1921	3,679	2,236	18,180	566	13,505	864	36,739	35,988	.....	111,758	127,421
Northwestern	1922	13,008	8,678	9,933	1,199	13,247	501	26,234	27,605	100,405	.....	.....
	1921	11,294	8,853	5,310	1,272	16,043	1,145	25,544	29,428	.....	98,889	107,771
Central Western	1922	13,382	9,689	23,595	305	4,371	844	30,537	30,583	113,306	.....	.....
	1921	13,000	10,236	15,217	212	4,193	2,360	30,066	34,112	.....	109,356	118,126
Southwestern	1922	5,232	2,451	4,619	152	6,374	655	15,528	18,558	53,569	.....	.....
	1921	5,073	1,814	3,622	73	6,567	443	16,493	25,075	.....	59,460	61,961
Total all roads	1922	49,520	28,329	196,639	8,257	47,664	4,651	231,433	236,762	803,255	.....	.....
	1921	41,885	28,424	141,748	7,686	51,480	7,434	204,212	228,498	.....	711,367	.....
	1920	33,314	27,951	182,272	10,104	61,956	13,615	152,972	328,922	.....	.....	811,106
Increase compared	1921	7,635	.....	54,891	571	.....	.....	27,221	8,264	91,888	.....	.....
Decrease compared	1921	.....	95	.....	.....	3,816	2,783	.....	.....	.....	.....	.....
Increase compared	1920	16,206	378	14,367	.....	.....	.....	78,461	.....	.....	.....	.....
Decrease compared	1920	.....	.....	.....	1,847	14,292	8,964	.....	92,160	7,851	.....	.....
March 4	1922	49,520	28,329	196,639	8,257	47,664	4,651	231,433	236,762	803,255	711,367	811,106
February 25	1922	46,729	27 740	187,447	8,072	47,704	4,330	199,157	214,107	735,286	659,642	793,295
February 18	1922	54,209	30,327	190,700	7,666	50,496	4,034	219,050	224,142	780,924	692,007	772,102
February 11	1922	*54,704	30,274	*193,377	7,823	52,638	4,015	222,908	222,673	788,412	687,867	786,633
February 4	1922	48,969	27,998	185,151	7,844	50,204	4,015	218,571	211,134	753,886	699,718	762,680

*Revised March 14, 1922.

The freight car surplus showed another reduction during the week ended February 28 to 245,100, of which 95,361 were box cars and 97,634 were coal cars while 19,955 were stock cars.

THE TRANS-CANADA LIMITED, the Canadian Pacific train which is run daily during the summer months between Montreal and Vancouver, in addition to the all-year-round train known as the Imperial, will be put in service on May 21. The equipment involved in the running of this train is valued at about $6,000,000. as the daily run involves the operation of 59 sleeping cars, 15 dining cars, 12 observation cars, 5 compartment cars, 12 baggage cars, and 24 locomotives. The through trains between Vancouver, Minneapolis, St. Paul and Chicago, known as No. 13 and No. 14, will be put in service in connection with the Soo Line on June 24.

Can We Look to the Tropics for Our Tie Supply?

Two Writers Point Out the Impossibility of Drawing On These Regions for Relief in the Near Future

WITH EACH recurring agitation concerning the depletion of the forest resources of North America, the attention of railway men is directed towards the large forests in the tropical areas of South America and elsewhere. This has led to considerable study of the timbers in these areas with particular reference to their suitability for use as ties under the climatic and service conditions existing in this country. The results of two such investigations are abstracted below.

The Feasibility of Introducing Tropical Ties in the United States*

By Nelson Courtlandt Brown

The question of our future tie supply in the United States has long been an important one and is growing more serious each year. This problem will some day be acute and it must be solved (1) by growing a sufficient tie supply in our native American forests by an improved system of forestry, (2) by making both our present and future native supplies last longer by preservative treatment and proper tie protective devices, or (3) by the introduction of ties from foreign sources of supply.

A study of the world's timber supply and the interdependence of various nations upon each other for their wood supplies has demonstrated that the tropics are the only regions of large timber supply left and that comparatively little exact scientific knowledge is available regarding them. By the tropics we must consider not only those nearby such as the West Indies, Central America, and northern South America, but also the Philippines, Africa, the Far East and the Pacific islands included in the tropical zone. The nearby regions such as the West Indies and Central and South America are, of course, of greatest interest.

Ties have been brought here from Cuba, Columbia, Brazil, Argentine and Africa, as well as Venezuela. Generally speaking, the atmosphere and soil conditions are much more severe, as affecting the life and utility of ties, in those countries than in this country. Moisture, warm air, etc., induce the growth of fungi which cause decay and in addition they commonly have white ants, etc., which are exceedingly destructive to these woods.

About 25,000 ties were imported from the Amazon district of Brazil and placed in the tracks of about five eastern railways in 1915, 1916 and 1917. One railway placed 5,000 ties, including 15 to 20 different varieties of hard, heavy woods from Brazil. They were presumably well-seasoned when put into service. It is reported that all have failed and have been removed from the track during the past year except one species locally known as Masaranadauba. The failure was reported due principally to "brooming" and to some extent to decay. All of these ties were 7 in. by 9 in. by 8½ ft. Among the 5,000 ties tried out by the one railroad, many had to be removed during the second summer and a large percentage had to be removed during the fourth summer of service on account of severe checking and "brooming." All of these ties had been adzed and bored at a treating plant but were used untreated.

In British Guiana tests were made by a local railway on 13 varieties of treated native wood and Baltic pine. The native woods were all of hardwood, measuring 4½ in. by 9 in. by 9 ft. long. The ties were grooved ½ in. in depth to receive the rails and bored with ⅞ in. holes for nail spikes. After eight years all varieties except three were sound and in good condition. These three were Kautaballi, untreated Mora and treated Baltic pine which was badly decayed throughout. The latter wood is the one chiefly used by European railways and lasts about 25 years in England when treated. The tests showed that: (1) The native woods, after treatment, were far superior to the treated Baltic pine; (2) mora and wallaba (Eperua falcata), when treated, resist decay under extremely adverse conditions of climate, precipitation and poor ballast.

Both mora and wallaba are abundantly available and can be produced fairly cheaply. There are three varieties of mora of which the red mora (Dimorphandra mora) is by far the best. When properly seasoned it makes an excellent tie timber. This experiment would seem to bear out the contention that tropical ties should be used only when treated. If this is so, it is unlikely that we shall look to the tropics to supply any considerable portion of our cross tie supply for a long time to come.

One large American railway carried on a test covering 30 varieties of tropical ties, chiefly of South American origin. Most of these failed in seven years due to both splitting and decay. Some only lasted two to five years while a few such as mora, cacaque, roble pellin and quebracho remained for 10 to 12 years except the mora, which varied in service from 4 to 12 years.

Another railway in the east used several thousand Brazilian ties in recent years. Of 2,647 ties examined closely, 827 were removed from the track on account of splitting and

*Abstracted from a paper presented before the annual convention of the American Wood Preservers' Association at Chicago on January 25.

"brooming" and decay after a service of 2½ to 3½ years. The engineer of tests stated that many more will have to be removed after slightly longer service.

To sum up the situation:

1—No definite conclusions can be established regarding the feasibility of introducing tropical ties on account of lack of definite experimental tests on a sufficient scale.

2—Great confusion exists in nomenclature and classification.

3—Too little is known of the relative merits, such as durability, etc., of these woods, even in their native habitat.

4—Very little is known of the seasoning qualities, with particular reference to the effect of changes of climate and temperature on their usefulness.

The Tropical Hardwood Tie Question

C. D. Mell.

People who like to talk in millions should revel in discussing the propositions pertaining to tropical hardwood ties for the American markets. There are few subjects about which there is so much idle speculation as the tie question. When a promoter of tropical woods hears that the railroads in the United States use about 110,000,000 ties annually, that the forests producing them are being rapidly depleted, and that the prices are high, he concludes at once that there must be a sure outlet for his wood in the form of ties for use in the United States.

He soon discovers that there are more than 70 different kinds of woods in this country which are being accepted by railroads here for ties, and that the demand has never exceeded the supply. Moreover, he soon learns that the prices paid for ties of native-grown timbers are much less than he had anticipated and also that railroads will not become interested in foreign woods for ties about which there are no data as to their fitness. It is safe to predict that another 20 years will pass before American capital will become interested in so speculative a venture as a tropical tie operation.

Entirely aside from the doubt whether the woods are hard and durable enough for tie purposes in the United States, the promoter or the timber owner himself is invariably uninformed as to what the railroads here require in the way of specifications. It is, of course, a relatively easy matter to teach the men in the forest to reduce the logs to a specified dimension so that the ties will pass inspection as far as their sizes are concerned, but there are other requirements that ties must meet and there are many kinds of defects which may render them unavailable. Trees in the tropical forests do not grow according to prescribed rules; the struggle for light and growing space is far keener in the dense forests of the tropical regions than it is in most parts of the temperate zone. It is hardly an exaggeration to say that 90 per cent of the trees large enough to yield ties of the required sizes are too defective to make them available for making ties. Of the remaining 10 per cent fully half are too valuable for other purposes and could not be turned into ties except at a distinct loss. This means, then, that only 5 per cent of the trees in the average tropical forest are available for use as ties, provided, of course, that they are not rendered unfit by improper felling.

Few promoters are considering carefully the question of inspection. Whether this is done at the point of origin or at the port of entry in the States there will doubtless be a good many rejections or at least de-grading if the contract should call for more than one class. As already stated the logs or trunks of trees in the average tropical forest are as a rule very defective, which invariably will show in one form or another in the finished ties. These defects, minor as many of them might appear, will nevertheless constitute the most serious drawback to the tropical tie business. This was illustrated by a small parcel of about two dozen sample ties from South America that arrived in New York about two years ago. These ties were selected especially to meet the approval of probable buyers of a half million ties that were offered, but a cursory examination of the lot revealed the fact that there was not a single tie among them that would have answered the specifications under the most lax inspection. In another instance over 60 per cent of a lot of about 200,000 ties cut some years ago in Colombia for use in Panama were rejected by the inspectors, which was more than sufficient to wipe out all possible profits in the transaction.

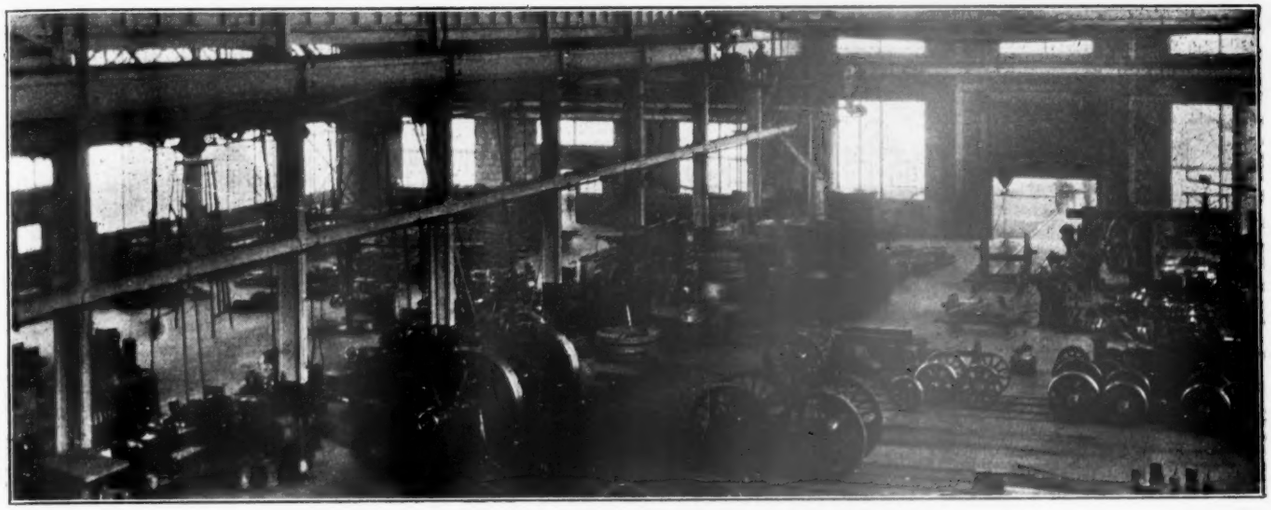
In considering this problem one must bear in mind that there is a demand locally in all the tropical American countries for logs and lumber from the native forests. The very best timbers are the kinds in common use, and in almost every instance these are the very woods that would be available for ties. The market price for such wood is based on what the native labor is willing to get the material out of the forest and deliver it to the market for. The cheapest way, and, at present the only practical way, to get these logs out is that followed by the native woodsmen, whose wages are calculated on their native monetary basis. The price set by local operators for logs delivered to market will be more advantageous to American operators than that which their logs of similar quality and sizes would bring, if they were reduced to ties and delivered to the United States.

In all tropical American countries there is a demand for ties and even in Brazil, where forests without end are said to occur, there is often a shortage of ties. The specifications there are less rigid than in the United States. Crooked ties will do as well as perfectly straight ones. Knotty, split, grooved and inbarky with sap are usually included among ties used in the tropics. Even logwood logs are used and as a rule they are very irregular. Thus, all things considered, the prospects for selling ties from the tropical woods are better in the tropics than in the United States. So long as there is no shortage of ties produced in the United States, it would seem highly inadvisable to attempt to bring untried woods here when the ocean freight alone may be equal to the cost of the untreated ties of known lasting qualities laid down alongside the tracks of the consuming lines.

The Minneapolis, St. Paul & Sault Ste. Marie has announced its intention to transport free of charge all supplies given by the citizens of Wisconsin for the American Committee of Russian Famine Relief.

Photo by Keystone View Company, Inc.

In the Canadian Rockies



What Shop Equipment Means To a Railroad*

Central Railway Club Discusses Relation of Maintenance and Repair Facilities to Equipment Owned

By V. Z. Caracristi
Consulting Engineer, New York

RAILROAD MOTIVE POWER departments are continually being pressed for reasons why they demand from the higher officials appropriations to cover machine tools and shop facilities, and the repetition of statements that these facilities are required to take care of current work is usually countered by explaining that the need for such facilities will have disappeared by the time the equipment and facilities can be received and installed. Operating revenue, having so many mouths to feed, must be largely conserved for purposes which cannot be deferred, and in the face of the large demands, the weak voice of the motive power department is drowned by the clamor of what at the moment appear to be more important demands.

Starting out on the basis that there can be no question as to the necessity for providing facilities of some nature to take care of each unit of power or equipment acquired, I am endeavoring to crystallize the tangible requirements and to point out the reasons why such requirements exist. Eliminating the equally important necessity for yard and terminal facilities, I would like to offer a chart (Fig. 1) showing the expenditures which experience has led me to believe necessary to take care of the locomotives and cars coming immediately under the jurisdiction of the motive power department.

To summarize, the object of this paper is to point out briefly the reason why equipment is compelled to stand idle when it should be at its best condition to meet operating demands, as well as to endeavor to create as a basis for further discussion the actual capital requirements in terms of equipment owned or in future to be purchased.

Available Hauling Capacity Not Utilized

As a matter of interest the data (Tables 1 and 2) on actual locomotive operation are submitted, locomotives being selected for the reason that they offer a well-defined measuring stick to compare relatively what is being accomplished by them in repayment for the labor, material, and money which have gone toward their creation. This measuring stick can best be expressed by their hauling capacity. The relation between weight, hauling capacity, and cost is practically constant. A definite amount of weight is necessary for each pound of hauling capacity available, and the locomotives are themselves purchased indirectly on a weight basis.

The purchase of additional hauling capacity immediately entails an obligation on the part of the purchaser to utilize such facilities, and to secure revenue therefrom through the handling of freight or passengers.

The uniform system of accounting used by railroads, based on regulations of the Interstate Commerce Commission makes available as a whole the total tractive power and ton-miles of freight hauled.

In order to make a division line between the freight and passenger service, it is necessary to convert passenger earnings into ton-miles. In my opinion this conversion can best be made on a basis of earning capacity, for which purpose the equated ton-miles on passenger basis can be obtained by multiplying the ton-miles of freight by the total passenger revenue and dividing this figure by the total freight revenue, the underlying thought being that the decreased tonnage will be offset by the increased rate. Such figures, although perhaps of no other value, will result in a ton-mile basis which is comparative from year to year. A comparison made on this basis, using Interstate Commerce Commission statistics of Class I railroads for the years 1902 to 1919 inclusive, brings out startlingly the fact that in spite of advanced facilities in design during the 18-year period the amount of work performed by the locomotive was seriously decreased, as is evidenced by the fact that the increase in tonnage available was 233 per cent; the increase in the number of locomotives was 173 per cent, with an increase in the hauling capacity of 299 per cent. The efficiency of the 1902 locomotive being used as a basis, the railroads during the year 1917 could have

*Abstract of a paper read before the March 9, 1922, meeting of the Central Railway Club at the Hotel Iroquois, Buffalo, N. Y.

handled 56,000,000,000 more revenue ton-miles than they did; in 1918, 76,000,000,000 more revenue ton-miles, and in 1919, 139,000,000,000 more revenue ton-miles.

In other words, had each pound of tractive power been utilized at the same efficiency as in 1902 there would have been a large surplus of locomotives during these peak periods.

These analyses cover totals for the 12 months of each year, and it may be claimed that peak traffic demands during individual months produced conditions not reflected by the yearly average. However, it should be remembered that the power delays brought about by inadequacy of repair shop facilities. Power of sizes and weights out of line with shop equipment result not only in increased repair expense but what is more serious, in great delay in getting power back into service.

Adequate provisions in the way of machine tools will have a great influence on recovering, if not passing established records previously made in ton-miles per pound of tractive power available.

Capital account expenditures cannot be made to better

TABLE I—COMPARATIVE ANNUAL STATISTICS OF LOCOMOTIVE OPERATION ON CLASS I ROADS

Year	No. locomotives, total	Tractive power total pounds	Revenue ton miles	Total passenger †revenue, dollars	Freight train revenue, dollars	Equated ton ‡miles passenger	Equated ton miles, to al freight and passenger
1	2	3	4	5	6	7	8
1902	37,516	768,502,779	157,289,370,000	$392,963,248	$1,207,228,000	51,109,045,250	208,398,415,250
1903	43,290	941,915,540	173,221,278,000	421,704,592	1,338,020,026	56,296,915,450	229,518,193,450
1904	46,146	1,052,307,260	174,522,089,000	444,324,991	1,379,002,000	56,196,112,658	230,718,201,658
1905	47,696	1,123,771,082	186,463,109,000	472,614,732	1,450,772,833	62,036,276,364	248 498,385,364
1906	50,954	1,260,633,673	215,877,551,000	510,032,583	1,640,386,655	67,116,330,605	282,993,881,605
1907	54,563	1,409,006,658	236,601,390,000	564,606,343	1,823,651,998	73,133,489,649	309,734,879,649
1908	56,867	1,498,793,551	*218,381,554,000	566,832,746	1,655,419,108	74,795,682,245	293,177.236,245
1909	56,468	1,503,971,444	*218,802,986,000	563,609,342	1,677,614,678	73,496,922,997	292,299,908,997
1910	58,240	1,588,894,480	*255,016,910,000	628,992,000	1,925,553,036	83,298,522,706	338,315,432,706
1911	60,162	1,681,495,905	*253,783,701,839	657,638,291	1,925,951,887	86,743,271,288	341,526.973,127
1912	61,010	1,746,964,128	*264,080,745,058	660,373,176	1,968,598,630	85,919,493,672	350,000,238,672
1913	62,211	1,847,798,393	*301,398,752,000	695,987,817	2,198,930,565	96,748,999,392	398,147,751,392
1914	61,442	1,886,519,588	*288,319,890,000	700,403,353	2,114,697,629	92,752,508,613	381,872,398,613
1915	61,882	1,970,295,300	*273,913,000,000	629,237,464	1,977,933,275	87,121,727,208	361,034,733,208
1916	60,790	1,989,132,700	*339,870,323,000	673,806,175	2,402 210,993	95,153,690,440	435,024,013,440
1916	60,990	2,024,118,700	*362,444,397,000	722,359,371	2,631,091,957	99,489,886,876	461,934,283,876
1917	61,533	2,087,949,700	*394,465,400,493	825,211,593	2,819,965,215	115,420,566,166	509,885,966,659
1918	63,531	2,223,246,296	*405,379,284,206	1,030,964,999	3,440,792,218	121,492,271,414	526,732,555,414
1919	64,983	2,301,602,581	*364,293,063,017	1,175,035,413	3,543,329,921	120,799,579,684	485,092,642,701

*Does not include returns from terminal and switching companies.
†Excluding mail, express, milk, parlor cars, switching and special train income.
‡Equated ton miles — passenger = ton miles (freight) X passenger revenue.

$$\frac{\text{Freight revenue}}{\text{Passenger revenue}}$$

relative peaks which existed during 1902 also existed in 1919. In other words, seasonal demands will not startlingly increase without reflection in the traffic during those months of lesser traffic movement.

Lack of Repair Facilities Decreases Net Returns

The reasons for the decrease in economic returns are a little complex, but they can be roughly analyzed as follows:

(a) The increased ratio of the power available does not appear to be serious.

(b) The lack of corresponding increases in terminal facilities in the way of increased length of receiving tracks, etc., as well as lack of expenditures for increased passenger facilities, are serious.

(c) The dominating influence affecting the decrease in work performed per unit of power available lies in the lack of capital expenditures for maintenance of equipment purposes. Individual road performance and increase in tonnage per locomotive mile run has been more than offset by motive

TABLE II—SUPPLEMENTARY DATA ON CLASS I ROADS' LOCOMOTIVE OPERATION

Year	Ton miles per lb. tractive power	Ratio of passenger to freight carrings	Capacity at 1902 efficiency	Surplus capacity, ton miles	Per cent	Earnings per lb. tractive power available = 5÷6÷3
	9	10	11	12	13	14
1902	271.2	.325	208,398,415,250	.....	...	$2,08
1903	243.7	.3152	255,447,494,448	47,049,079,198	20.9	1.87
1904	219.1	.3222	285,375,728,912	54,657,527,254	23.2	1.73
1905	221.1	.3327	304,796,717,438	56,298,332,078	22.7	1.80
1906	224.5	.3109	341,883,852,117	57,889,970,712	20.5	1.78
1907	216.3	.3091	382,122,606,649	72,387,727,000	23.4	1.69
1908	195.8	.3425	406,472,811,103	113,295,574,786	38.6	1.48
1909	194.4	.3359	407,876,956,612	115,677,047,635	39.3	1.49
1910	212.8	.3266	431,108,182,976	92,792,750,270	27.4	1.61
1911	202.5	.3418	456,021,689,436	115,494,716,309	33.9	1.53
1912	200.0	.3405	475,776,671,513	125,776,432,841	35.7	1.50
1913	215.4	.321	501,022,924,381	103,875,172,989	26.0	1.56
1914	202.0	.3217	511,632,348,265	130,559,949,652	34.2	1.49
1915	183.2	.3181	534,344,085,360	173,309,352,152	48.0	1.32
1916	218.7	.280	539,450,788,240	104,426,774,800	24.0	1.54
1916	228.0	.2745	548,940,991,440	87,006,707,564	18.8	1.65
1917	244.2	.2926	566,151,958,640	56,275,991,981	11.0	1.74
1918	236.9	.2997	602,944,395,475	76,211,840,061	14.4	2.01
1919	210.7	.3316	624,194,619,967	139,101,977,266	28.6	2.05

advantage at this time in any direction by the railroads than through provisions for modern repair shops and equipment.

The selection of machine tools, traveling cranes, small tools, jigs and fixtures can easily be made to meet any motive power requirements. The principal danger in the selection of machine tools is in giving undue weight to maximum performance of individual items.

The purchase and installation of special high-powered individual-purpose tools should be made only after the most minute analysis of the actual immediate and prospective requirements. Each expenditure in the way of machine tool facilities should be made so as to give the maximum return in the way of plant output and not considered on the basis of the output of the individual unit. Over-equipment of individual departments does not assist either the time or cost element of a locomotive which has to be passed through all the departments of the repair terminal.

Equipment Maintenance in Slack Periods

It is well to point out the fact that the railroads of this country have been, and now are, compelled to operate under serious handicaps in order to meet the current financial requirements necessary to keep them out of the hands of receivers.

A more specific explanation for the reasons resulting in this condition is readily found in either one or a combination of the following facts, all of which are subject to correction either by the railroads or the Interstate Commerce Commission.

First. The railroad companies appear to have purchased power at a higher ratio than the normal increase in tonnage available justified, causing power to remain idle.

Second. In the efforts of railroad officials to maintain a uniform ratio between income and expense, it is customary to reduce the maintenance of equipment appropriations during the slack months, thus causing the power in many cases, to be unavailable to take care of the peak load transportation in the fall and winter months without the assistance of the locomotive builders.

Third. Unfortunately, it has been the custom of motive power and transportation officials when purchasing new power, to endeavor to "keep up with the Joneses" by purchasing power in large sizes, and in a number of cases the tonnage available, yard facilities, bridge, and right-of-way limitations, and other local causes have prevented the full utilization of all of the extra drawbar pull available.

Fourth. Labor conditions, both in the transportation and motive power departments, have tended to decrease power and operating efficiencies.

Fifth. The amount of money expended by the railroads for logical repair shop facilities has been lamentably out of proportion with the amount of money expended for motive power and cars, resulting in inadequate facilities for needed repair and modernizing work. The reason for this is probably due somewhat to the fact that it is easier to secure financial assistance through car or locomotive trust certificates than it is to secure money on blanket or other mortgages to be used for the purpose of shop extensions or construction.

Sixth. The analysis of data from individual railroads shows that the purchase of power has in some cases been

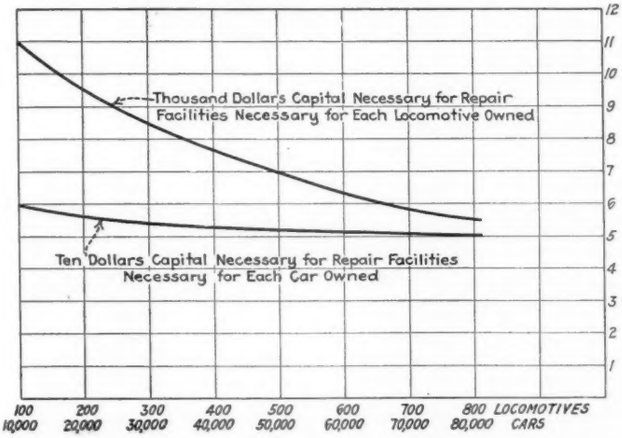


Fig. 1—Chart Showing Desirable Relation of Repair Facilities to Equipment Owned

justified and that the tons hauled per pound of available tractive power show decreases not out of line with changes in operating and labor conditions.

Taken as a whole, however, the figures clearly indicate a tendency to purchase power in advance of traffic requirements and further show inadequate provision for the roundhouse and general repair work necessary to keep the investment for power active.

Lack of Shop Facilities Delays Improvement Programs

The lack of adequate shop facilities is the greatest factor obstructing the purchase and application of modern fuel saving or other devices which would permit the increase of revenue ton-miles per pound of tractive power available. Lack of facilities to take care of such equipment when installed, and the fact of additional engine failures and delays has naturally resulted in the motive power department's being averse to take on additional obligations for maintenance with the fore-knowledge of inability properly to care for the same. As a matter of self-defense this tendency is a natural one, and as long as reasonably adequate supplies of tools and facilities are not available the position is well justified.

When the fact is taken into consideration that progress in locomotive development in the past few years has been almost entirely in the direction of devices which can be applied to existing power, and that the application of such equipment will make any existing locomotive as efficient as one of equal power just out of the builder's shop, the enormous size of the economic loss to the railroads can be visualized.

I am not an advocate of the attachment on the locomotive of every piece of apparatus that presents itself which theoretically might affect savings in operation, and I do not belittle the value of cold-blooded analysis of what the over-all economic results of each individual application will mean to the railroad organization as a whole. There are so many conditions of local operation which affect and govern, that each proposal can only be made the subject matter of intelligent decision by those intimately familiar with the governing factors.

A locomotive, when out of service for the most trivial cause, is just as expensive to the property as a whole as one legitimately tied up waiting for periodical over-hauling, and too much attention cannot be devoted to the necessity for adequate facilities. Each railroad should have every locomotive surveyed to determine if its useful life is actually finished through use or inadequacy, and if there is not the possibility of placing this engine on an equal basis with an engine just received from the builder, through application in its own shops of such modern improvements as superheaters, feed water heaters, cut-off indicators, brick arches, power reverse gears, valve gears, etc.

Trust Certificates Suggested for Betterment Work

Full capital account credit should be given for all betterment work and additions made to old power, and a new value placed on the entire locomotive after the completion of such betterments, in line with its ability to compete with a new unit of equal capacity, irrespective of its old arbitrary or book value. A market might be created for equipment betterment trust certificates to cover a proportion of the capital account betterment cost. Such certificates would have more equity behind them than if applied against new units, and would make available the necessary capital to rehabilitate railroad property with the advantage of utilizing in full capital previously expended.

Repair work should be equalized over the 12-months' period by arbitrary charges against income in the months of great business for credit and use during periods of revenue depressions.

Each purchase of new locomotive equipment should be made the subject of special study by the accounting, motive power and transportation officials assisted by outside advice if necessary, to determine: (a) Actual necessity, (b) size and capacity which will give the greatest net returns to the company, (c) type.

Locomotive purchases are in nearly all cases made at a time when erecting shop space is at a premium. This condition could be obviated by cold-blooded expenditures for repair facilities in combination with the scrapping of all papers relative to monthly budget allowance for maintenance of equipment work.

The railroad repair shops are usually operated at their peak during those months in which the cost of doing the work is at its highest, and what little organization remains in the spring time is engaged in hoeing the grass between the stones of the shop highways. The fluctuations in the pay-roll of both the classified and running repair shops are appalling, and these fluctuations are largely brought about by the month-to-month method of accounting and record-keeping in vogue by the transportation systems. Expending freely for maintenance account when earnings are temporarily good, at the expense of a starvation policy when earnings fall off due to natural seasonal conditions, is not a good business policy.

Explanation of Chart

This chart (Fig. 1) represents the amount of capital necessary for repair facilities, including yard, track, and

other work, for every locomotive added to the property.

For instance, a property having 500 locomotives should have, in the way of facilities for the repair and upkeep of these locomotives, property having a value of $3,500,000, and if 50 additional locomotives were purchased, the amount of money which should be expended for addition to the repair facilities is $6,700 for each locomotive, or $325,000 for 50, thus making the amount of money expended in facilities for the repair and upkeep of 550 locomotives $3,825,000.

Fig. 1 also shows the amount of money which should be expended for capital account purchases in the way of repairs, tracks, and facilities for the running and heavy repairs of freight cars. It will be evident that a property having 20,000 cars should have an investment of this nature having a value of $1,140,000 and in the event of the addition of 2,000 cars, $56.00 represents the amount of investment necessary to take care of each car, or a total of $112,000, thus making the total investment to take care of 22,000 cars $1,252,000.

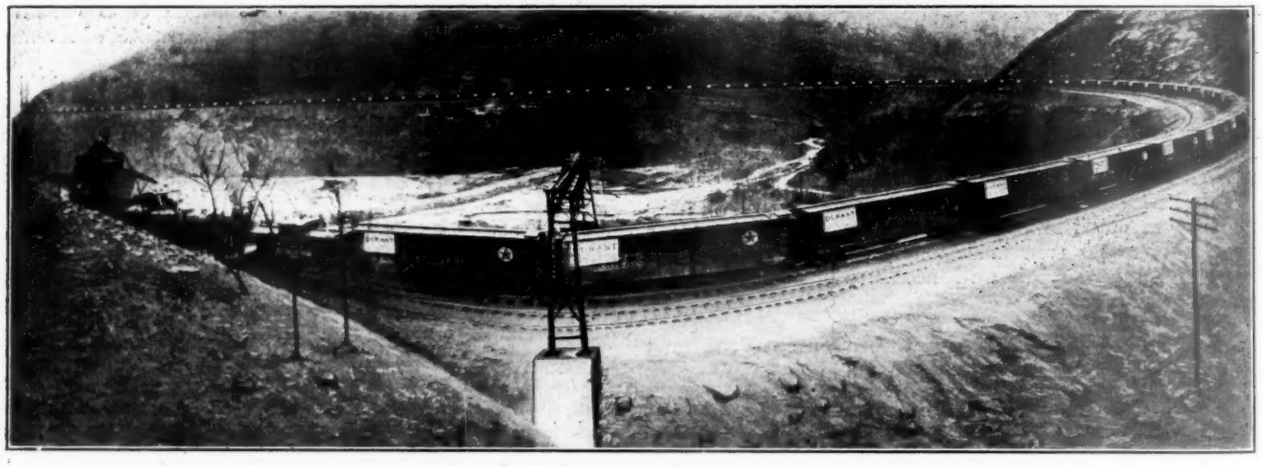
Freight Transportation de Luxe

THE PICTURE shown below represents the special hundred-car freight train, filled with Durant automobiles (described in the *Railway Age* of February 4, pages 339 and 340), as it passed around the Horse Shoe Curve on the Pennsylvania Railroad, about eight miles west of Altoona, Pa., on January 6, last. In this unique photograph it is possible to distinguish more than 90 of the 100 cars in the train; and by the exercise of a little imagination it is possible to do so in the reduced-size engraving here shown.

An officer of the Pennsylvania informs us that the train of 100 cars was kept intact from Greenville (Jersey City) to Ogden, Utah, 2,387 miles. At the time this picture was taken there were four locomotives, two at the front and two at the rear.

The train started from Greenville on Monday, January 2; it was stopped over night at Harrisburg, Pa., and over two days at Altoona.

At Ogden it was divided into two trains of 50 cars each, and these trains left there on Tuesday, January 17, arriving at Sacramento, Cal., 3,080 miles from the starting point, on Thursday morning, January 19. As noted in our former article, the train was routed through various cities for advertising purposes and the time, through, 17 days, includes many stops.



Train of 100 Cars, Ascending Grade at Horse Shoe Curve on the Pennsylvania

The leading locomotives, seen at the extreme upper left hand corner of the picture, are about seventy-five feet higher than the caboose, which appears in the foreground

Self-Starting Induction Motors

THREE-PHASE induction motors with a centrifugal switch and a resistance mounted in the rotor have been developed by the Triumph Electric Company, Cincinnati, Ohio, which are called self-starting motors. All 3-phase induction motors are self-starting, but the feature of this particular type is that high torque is provided automatically at the time of starting.

The more common types of induction motors which are provided with a wound rotor and resistance for the purpose of obtaining high starting torque, are equipped with an external resistance starting control or with a resistance mounted in the rotor. This resistance affords the desired starting torque and it is cut out by a hand operation when the motor attains full speed so that high power factor and high efficiency may be obtained when the motor is working under load. The fundamental difference of the Triumph motors is that this resistance, mounted in the rotor, is cut out by an automatic switch when the motor reaches normal speed.

A 50 h.p. Motor May Be Started with a Single Throw Switch

The centrifugal governor is mounted on the shaft inside the end bracket and is entirely automatic and independent of the operator. The stator frame is made of close grained soft iron and is bolted to a cast iron base. The bearings are made of bronze and are provided with pressure release grooves drained to the oil well. The "TR" automatic induction motors, as they are called, are made in sizes ranging from 3 hp. to 50 hp., and are designed for operation on 220, 440, or 550-volt, two or three-phase, 60-cycle circuits.

Gasoline Motor Cars with Four-Wheel Drive

For Passenger, Freight and Light Switching; Increased Tractive Effort by Using All Wheels as Drivers

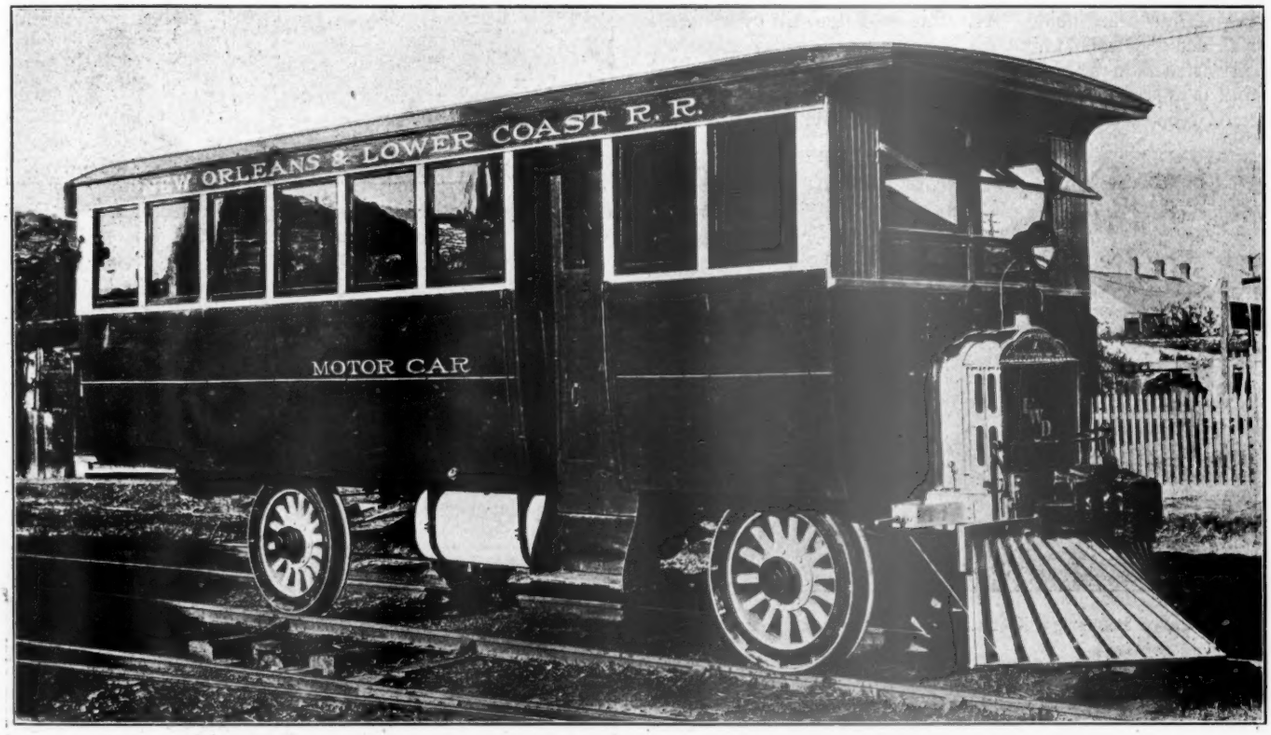
INCLUDED among the rail motor cars now in service are a number manufactured by the Four-Wheel Drive Auto Company of Clintonville, Wis. As the driving power on these cars is applied to all four wheels they have a number of advantages over cars which are driven by only one pair of wheels. Making every wheel a driving wheel and equally distributing the load over the wheels gives the car the greatest possible adhesion and permits the use of high tractive effort. This is important on roads which have numerous steep grades or are located in sections where winter weather is severe and the rails often are covered with snow and ice. In actual operation the cars have travelled over rails covered with snow to a depth of approximately one foot and in places drifted to a depth of two feet. This was done with little difficulty and without falling behind the regular schedule.

Another advantage gained through the application of power to each of the four wheels is that it eliminates the necessity of a pony truck. When rounding a curve, the differentials in the front and rear axles take care of the difference in speeds of the wheels on the inside and outside tracks and do away with the rail climbing action which has given trouble on rear driven rail equipment. At Clintonville, where numerous demonstrations in freight and passenger service have been given, there is a 16 deg. curve at one place in the track. Train operators are warned not to exceed a speed of 15 m.p.h. on this curve, yet during these demonstrations the motor cars have rounded it with ease at a speed of 23 m.p.h.

The increased available adhesion resulting from the four-wheel drive principle peculiarly adapts this type of car to use with trailers or for light hauling and switching. The manufacturer, anticipating its use for such purposes, has applied standard M. C. B. couplers on the front and rear of the car. This enables owners to attach trailers and increase the carrying capacity to meet traffic demands.

Details of Design

The standard rail motor car chassis weighs 8,400 lb. and has a 13-ft. wheelbase. The frame is 16 ft. 8 in. long and 3 ft. wide. The wheels are 36 in. diameter with rolled steel rims of M. C. B. contour. Both axles are of the rigid type, full floating. The engine has four cylinders, each 5.1 in. diameter by 5.5 in. stroke, and a power rating of 42 hp., S. A. E. rules, but actually develops 68 hp. on a brake test. The transmission provides for three speeds. There is a choice of five gear ratios ranging between 5 to 1 and 12.05 to 1, which are suitable for speeds in high of 35, 30, 25, 20 or 14 m. p. h. With a gear ratio of 5 to 1 the maximum drawbar pull is 1,968 lb. at 8.7 m.p.h. and 492 lb. at 35 m.p.h. while with a gear ratio of 12.05 to 1 the drawbar pull is 4,755 lb. at 3.5 m.p.h. and 1,189 lb. at 14 m.p.h.



Four-Wheel Drive Rail Car Used on a Sixty-Mile Run Between New Orleans and Buras

The car is equipped with a high-speed reverse gear which enables it to travel at the same speed in reverse as it does forward. This reverse mechanism is composed of a nest of bevel gears on the order of the conventional bevel gear differential, only much larger and of superior design and construction.

There is a service foot brake and an emergency hand brake, both of the external band type. In addition, Westinghouse air brakes can be applied if desired. Sanders are located at both ends.

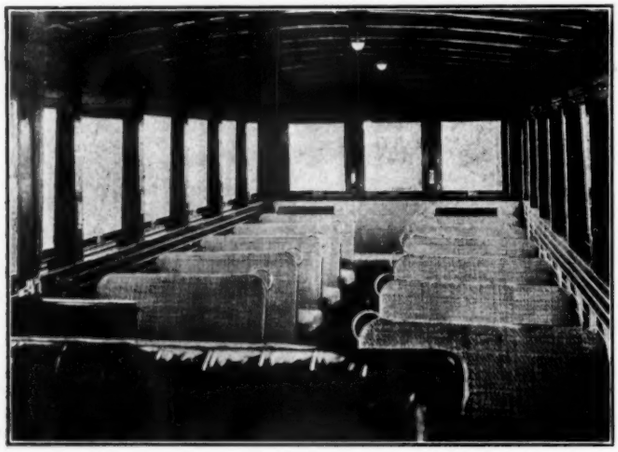
An outstanding feature of the FWD design is the readi-

ness and cheapness with which it can be converted from a highway truck to an efficient car for railway service. This fact is borne out by the continual increase in the number operated by the government at various arsenals and proving grounds throughout the country. There is now a total of 28 FWD cars in government service operating on rails, all of which were formerly used on highways and were converted at only the expense necessary to change from rubber tires to flanged steel rims, mount standard M. C. B. couplers front and rear, and install a high-speed reverse gear and a sanding device. Where cars are to be used for passenger service the expense of conversion must include body equipment and is, of course, somewhat greater.

Cars Now in Service

The first truck of this type put into operation on rails was a standard three-ton truck converted by the Northwestern Pacific at San Francisco, Cal., into a car suitable for light switching. A tunnel was being constructed and it was found that a steam locomotive filled the tunnel with smoke and made it impossible for the men to see or breathe after the engine had been inside. After investigation, the FWD truck was decided upon and with little expense one of them was converted into a car which filled the requirements so well that it is still being operated in light switching service.

At New Orleans, La., an FWD rail passenger car seating



Interior of Passenger Car on New Orleans & Lower Coast

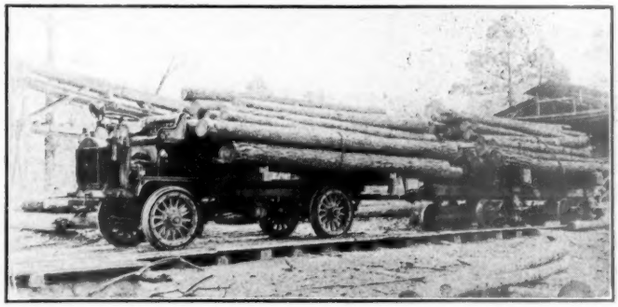
32 persons, operates on a 60-mile run between that city and Buras over the New Orleans & Lower Coast. This car makes one round trip, or a total of 120 miles per day. Latest reports show that the car, during a period of 13 months, operated at an average cost of 15 cents per mile as compared to 90 cents per mile with a steam train. These figures include operator's wages, fuel, lubrication, supplies, maintenance and insurance but do not include anything for depreciation. The motor car averaged 7½ miles per gallon of gasoline. This short line formerly operated a steam train at a loss and was obliged to discontinue service during the war. After the war it purchased a gasoline rail car and resumed operations. It was then found that not only was this car cheaper to operate but, with its weight of 6¼ tons, the depreciation of the track was much less than with the 25-ton locomotive hauling one or two 15-ton coaches.

The New Orleans & Lower Coast Railroad has, with this rail car, operated at a comfortable profit and has since the inauguration of this service enjoyed such a substantial increase in patronage that it has become necessary to increase the capacity by the purchase of a trailer coach, which will seat 40 passengers. This installation is a good illustration of what the rail car can accomplish for short line railroads and on short runs on main line tracks.

The Oil Fields Short Line, which operates from Dilworth, Okla., in the oil fields to Clifford, where it connects with the St. Louis & San Francisco, is at present installing an FWD rail car. This line is only about six miles in length and the traffic is too light to warrant the operation of a steam train. This is typical of numerous short lines throughout the country, which might operate more successfully with a light rail car than with a heavy steam train.

The Ashley Lumber Company of Hamburg, Ark., uses one of these cars for hauling logs from the woods to their mill. The car operates satisfactorily with trailers and gives a cheap and efficient service.

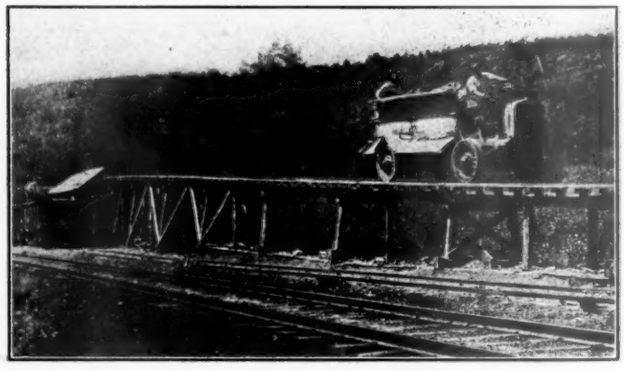
At Rockland, Mich., the Michigan Copper Mining Company operates a rail car which is equipped with a steel side dump body and is used for hauling ore from the mine to



The Ashley Lumber Company Employs a Motor Car to Haul Logs from Woods to Mill

railroad cars, a distance of about one mile. In 1919 when the mine was operating at full capacity this car operated continuously and hauled on an average of 219 tons of ore per day.

The Cripple Creek Consolidated Gold Mining & Milling Company of Cripple Creek, Colo., is operating a motor car on rails between their mines and the city of Cripple Creek. This car was formerly a standard three-ton truck used for road service, but was converted into a rail car and equipped with a passenger body which has a seating capacity of ap-



A Rail Motor Car with Dump Body Hauls Copper Ore from Mine to Main Line Connection

proximately 30 persons. It is used for hauling miners to and from the mines.

Including those operated by the government, there are now over 60 four-wheel drive rail motor cars in freight and passenger service in the United States and foreign countries.

THE PROVINCE OF ALBERTA announces that 93 miles of new railway was constructed in the province last year, bringing the total mileage up to 4,789, as compared with 1,782 in 1910, and 1,060 in 1905.

General News Department

The Shops of the Pennsylvania at Olean, N. Y., were damaged by fire on March 5; estimated total loss including some damage to 25 locomotives, $100,000. The number of men at work in these shops was about 300.

Sleeping Car Conductors Meet in Chicago

The national convention of the Order of Sleeping Car Conductors was held at Chicago during the first three days of this week. This organization has negotiated a working agreement with the Pullman Company and is one of the labor groups not before the Railroad Labor Board in the present wage hearing.

Disastrous Fire Wrecks Burlington's General Office Building

The 15-story general office building of the Chicago, Burlington & Quincy at Chicago was badly damaged by fire on March 15. The fire started at one o'clock in the morning in a neighboring building and soon spread throughout the Union Station business district, destroying several large structures. The upper seven floors of the Burlington building were seriously damaged, nothing but the main partition walls remaining. Many important papers, valuation records and engineering plans were lost.

Legislates Against Branch Line Abandonments

By a vote of 18 to 17, the Kentucky State Senate defeated the Perry bill on March 8, providing for the abandonment of branch lines in that State. The bill was originally intended to permit the abandonment of a nine-mile branch line of the Southern between Burgin, Ky., and Harrodsburg.

Santa Fe's Solicitation Campaign

For the past two months the Atchison, Topeka & Santa Fe has been conducting a campaign for the solicitation of business by employees. Post cards bearing well-worded "traffic tips" have been distributed widely among employees and their co-operation requested. An employee filling out a card puts upon it the names and addresses of business prospects, and sends it to the proper division superintendent, who, in turn, places it in the hands of a local agent. The enthusiasm with which the employees have entered into the work has accomplished results, and the campaign is to be continued.

Derailment at Union City, Ga.

Seven passengers (two of them employees of the road) were killed and 16 injured in the derailment of the rear car of a passenger train on the Atlanta, Birmingham & Atlantic, near Union City, Ga., on March 13. The car was derailed by the breaking of a wheel while on a trestle, or just before entering on the trestle, and broke away from the car ahead of it and fell 50 ft. to the stream below. The occupants of the car numbered about 30 altogether, and a number of the injured were not expected to live. The Receiver of the road issued a statement saying that the wheel that broke was a new one.

Power Brake Investigation

The Interstate Commerce Commission, in connection with its investigation of power brakes and appliances, has ordered that upon application of Clark & La Roe, attorneys for the Automatic Straight Air Brake Company, the deposition of F. K. Vial of Chicago, with respect to the authorship and the subject matter stated in a certain communication addressed by him to H. I. Miller, president, Automatic Straight Air Brake Company, New York, N. Y., under date of September 20, 1918; and also with respect to the authorship of and the subject matter in a paper read before the Richmond Railroad Club, April, 1915, "The Chilled Iron Wheel," be taken before Examiner John T. Money, at the offices of said Vial, in Chicago, on March 20.

I. C. C. Proposes Conference With State Commissions

The Interstate Commerce Commission has addressed a letter to President Jackson of the National Association of Railway and Utilities Commissioners suggesting a conference to be arranged in the near future between a committee representing the association and a committee representing the commission. The commission wishes particularly to consider what can appropriately be done in view of the declarations made by the Supreme Court in its decision in the Wisconsin intrastate rate case, in which it was stated that although the commission had authority to order increases in the state rates to prevent discrimination, conference between the Interstate Commerce Commission and the state commissioners may dispense with the necessity for any rigid federal order as to the intrastate rates, and leave to the state commissions power to deal with them and increase or reduce them at their discretion. The commission says it could participate in such a conference if it were held in Washington at any time during the latter part of this month after the 14th.

Labor Board to Investigate Erie's Contract with Meadville Company

The Labor Board has ordered a thorough investigation of a contract for shop work which the Erie has made since the subject of contract work came before the Board and has authorized a member of the Board to make an investigation and "invoke the aid and counsel of the Department of Justice." The resolution ordering this investigation specifically mentions the contract made recently with the Meadville Machinery Company for the operation of the Erie's shops at Meadville, Pa., and says in part:

"Since the hearing (of the contract cases, reported recently in the *Railway Age*) information has come to the Board that the Erie without awaiting the decision of the Board upon said contract cases has entered into a further contract by virtue of which all the shops of the entire Erie system, including those involved in the above cases, have been contracted to a newly incorporated company called the Meadville Machinery Company. Public announcement has been made of the fact that the officers of the Meadville Machinery Company are the recent officers of the Erie.

"The principal question involved in the above cases is whether or not the employees of the companies to which certain shops had been contracted are in law and in fact the employees of the Erie and therefore still subject to the rules, working conditions and wages established by the order of this Board.

"Said employees having now been shifted a second time before the Board had rendered its decision in said pending cases and said contract system having been extended so as to embrace all other shops on the road it becomes the duty of the road upon its own motion to investigate the facts surrounding this alleged contract of the carrier with the Meadville Machinery Company.

"The Board therefore orders: 1—That the contract cases be reopened for the purpose of taking additional proof as to the issues involved in said cases; 2—That a thorough investigation be made of all the facts and circumstances surrounding said alleged contract and the operations being conducted thereunder; 3—That a member of this Board accompanied by such expert and stenographic assistance as may be deemed necessary be authorized and directed to go on the property of said carrier to conduct said investigation and to institute such legal proceedings as may be deemed necessary to effectuate this order after having first secured all the information possible here in Chicago; 4—That the member of the Board conducting said investigation be and is hereby authorized to invoke the aid and counsel of the Department of Justice at Washington if he deems advisable."

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JANUARY, 1922

Name of road.	Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
*Akron, Canton & Youngstown	170	$147,835	$1,431	$155,516	$14,429	$17,203	$5,298	$41,499	$8,717	$87,146	56.00	$68,370	$59,370	$43,204	—$4,317
Alabama & Vicksburg	141	167,621	58,573	239,526	36,619	52,462	8,940	104,773	11,857	216,477	90.40	23,049	4,542	5,077	3,332
Vicksburg, Shreveport & Pacific	171	178,105	93,942	290,064	42,654	71,687	9,134	124,223	13,714	263,632	90.90	25,432	9,263	1,089	—4,546
Ann Arbor	293	297,332	44,533	353,931	37,628	77,825	10,299	182,476	14,166	322,394	91.10	31,537	12,224	—15,071	3,051
Atchison, Topeka & Santa Fe	8,864	8,021,737	3,373,128	12,398,641	1,674,590	3,667,951	283,326	4,510,826	331,302	10,464,738	84.40	1,933,903	944,264	888,164	27,856
Gulf, Colorado & Santa Fe	1,907	1,216,506	301,804	1,615,391	466,726	542,445	41,802	589,506	72,973	1,713,402	106.07	—98,011	—109,459	—203,679	89,481
Panhandle & Santa Fe	857	395,147	103,028	528,484	114,880	209,707	7,021	217,652	19,191	568,247	107.52	—39,763	—62,559	—100,906	—157,144
Atlanta, Birmingham & Atlantic	639	219,918	34,589	273,752	57,861	88,968	21,128	154,385	15,943	338,387	123.60	—64,635	—84,046	—97,943	—138,736
Atlanta & West Point	93	95,662	69,075	181,562	24,835	50,112	8,014	75,621	9,933	171,770	94.66	9,792	619	—6,608	11,314
Western of Alabama	133	97,703	66,554	181,333	23,735	49,216	7,765	69,438	10,449	163,254	90.00	18,079	10,376	10,809	10,705
Atlantic Coast Line	4,924	3,425,099	1,523,671	5,294,044	633,126	956,174	108,756	2,297,250	146,610	4,181,692	78.99	1,112,352	855,899	778,257	340,790
Charleston & Western Carolina	342	192,975	35,741	236,494	45,421	45,422	6,706	114,819	6,200	218,568	92.40	17,926	6,832	—657	—58,322
Baltimore & Ohio	5,235	11,270,172	2,110,758	14,269,760	1,900,762	2,749,996	304,235	6,237,383	475,449	11,795,925	82.70	2,473,835	1,811,234	1,523,105	905,810
Baltimore & Ohio Chicago Term	90	.....	.....	201,085	12,330	32,868	1,757	129,478	9,807	190,563	94.80	10,522	—28,140	68,640	33,693
Staten Island Rapid Transit	23	62,219	84,656	158,686	43,413	50,669	1,362	114,404	13,962	223,810	141.00	—65,124	—82,580	—95,462	—64,206
Bangor & Aroostook	650	581,778	78,137	678,569	102,900	121,614	4,258	207,713	18,668	455,204	67.10	223,365	183,509	189,648	43,386
Belt Ry. Co. of Chicago	31	.....	.....	436,434	25,209	51,979	942	226,605	9,352	314,087	72.00	122,347	89,553	132,367	133,328
Bessemer & Lake Erie	225	510,369	31,392	559,804	64,360	286,625	15,954	251,309	25,062	648,338	115.80	—88,534	—121,238	—105,582	39,400
Bingham & Garfield	35	9,787	2	9,882	18,234	2,617	1,637	3,274	4,340	30,105	304.60	—20,223	—26,552	—22,987	—1,039
Boston & Maine	2,287	3,456,241	1,751,703	5,769,545	869,869	1,223,957	54,863	3,094,658	241,454	5,509,443	95.50	260,102	96,793	—164,291	—1,549,901
Brooklyn Eastern Dist. Term	9	108,115	.....	114,910	4,425	24,146	100	41,942	4,778	75,391	65.60	39,519	33,170	33,170	10,743
Buffalo & Susquehanna	253	161,242	6,654	171,848	30,103	62,935	2,085	58,678	9,682	163,483	95.10	8,365	5,115	28,659	17,598
Buffalo, Rochester & Pittsburgh	589	1,035,001	140,735	1,217,428	126,026	382,038	16,071	459,700	38,061	1,034,044	84.90	183,384	147,938	160,684	213,444
Canadian Pacific Lines in Maine	233	207,529	35,902	259,805	21,616	52,007	4,478	138,877	2,864	219,842	84.60	39,963	23,963	13,664	48,995
Carolina, Clinchfield & Ohio	291	554,893	36,414	599,080	70,036	129,037	22,868	163,155	15,591	400,521	66.90	198,559	158,452	192,226	201,365
Central of Georgia	1,913	951,548	405 180	1,506 887	218,521	328,017	65,010	701,719	76,000	1,392,600	92.40	114,287	33,236	58,494	—80,592
Central of Georgia	328	229,277	93,406	341,318	36,271	71,571	20,250	207,009	18,875	354,126	.....	.....	.....	.....	.....
Central of New Jersey	685	3,059 063	642,353	3,969 907	405,856	1,199,539	34,095	1,724,091	112,274	3,492,083	88.00	477,824	205,076	193,999	101,084
Central of Vermont	413	322,683	93,854	460,237	53,658	99,349	10,519	286,558	24,978	476,640	103.60	—16,403	—33,406	—53,106	—176,357
Chesapeake & Ohio	2,548	4,863,938	765,808	5,889,542	600,013	1,513,703	64,688	2,376,812	165,901	4,736,987	80.40	1,152,555	884,768	1,028,154	491,736
Chicago & Alton	1,050	1,862,202	487,571	2,427,480	232,852	624,330	59,620	996,569	62,716	1,988,646	81.90	438,834	363,523	173,723	—35,232
Chicago & Eastern Illinois	945	1,522 308	385 370	2,035,635	213,370	532,899	37,346	855,885	65,829	1,716,677	83.50	338,958	253,359	260,494	46,980
Chicago & Northwestern	8,402	6,578,276	2,312,516	9,974,817	1,032,050	2,475,343	165,270	5,238,061	334,454	9,305,960	93.30	668,857	—64,066	—151,304	—1,279,561
Chicago, Burlington & Quincy	9,393	8,542 151	2,139,911	11,662,144	1,072,343	2,770,485	176,982	4,965,358	382,096	9,480,095	81.30	2,182,049	1,267,441	1,152,054	1,311,859
Chicago Great Western	1,496	1,161,581	347,409	1,630,488	146,997	500,351	63,839	861,116	57 288	1,642,364	100.70	—11,876	—95,478	—201.199	1,017
Chicago, Indianapolis & Louisville	657	813,983	238.666	1.146,492	114,975	256.219	30,973	471,378	35.807	922,559	80.50	223 933	172,653	84,538	—28,653
Chicago Junction	12	.....	.....	392,452	36,656	39,818	764	201,494	9,699	238,431	73.50	104021	78.461	160,151	149,550
Chicago, Milwaukee & St. Paul	11,030	7,954,902	1,875,316	10,872,247	1,144,457	3,242,072	170,223	5,255,634	364,591	10,235,087	94.10	637,160	—166,288	—466.787	—1,214,004
Chicago, Peoria & St. Louis	246	158,090	21,931	191,177	17.827	42,301	4,724	120,559	10.824	196,235	102.60	—5,058	—14,571	—37,234	—64,294
Chicago, Rock Island & Pacific	7,651	5,911,349	2,026,281	8,568,236	1,286 507	2,025.531	180,050	4,153,544	237,008	7,905,948	92.30	662,288	145,859	—132 605	—156,462
Chicago, Rock Island & Gulf	461	351,082	78,457	470.312	64,879	102,453	13,717	218,977	13,651	414,854	88.20	55,458	41,324	19,600	—5,050
Chicago, St. Paul, Minn. & Omaha	1,749	1,357,891	472,833	1,956,525	281,325	426,301	35.119	1,091,660	72,003	1,914,511	97.90	42,014	—83,612	—103,686	19,847
Cin., Indianapolis & Western	321	253,648	49,424	320,079	36,891	76,434	9,995	159,449	20.403	293,339	93.20	21,740	6,266	—11,667	—45,940
Colorado & Southern	1,099	693.537	146.972	901.832	106.446	266.071	17,168	371,099	45 872	813,908	90.20	87.924	23.480	26.129	320,897
Ft. Worth & Denver City	454	462,195	176,507	672,831	81.013	149,243	12,036	263,175	37,601	547,880	81.40	124,951	93.292	100,154	139,884
Wichita Valley	256	76,909	22,588	105.881	27.172	11,591	91	45.474	1,558	83,068	78.40	22,813	16,454	8.165	367
Columbus & Greenville	226	81,292	33,127	121.148	25.771	11.386	2,537	51,750	7.549	98,948	81.70	22,200	22,010	3.338	—39,912
Delaware & Hudson	887	2,810.344	298.215	3,413,924	385.335	893,991	42,285	1,400,377	158,983	2,923,902	85.60	490.022	420.810	450.091	225,747
Delaware, Lackawanna & Western	994	4,436,744	1,079,034	6,193,591	559.108	1,372,433	111.085	2,755.051	160,167	5,006,976	80.80	1,186.615	709,472	683,963	571,568
Denver & Rio Grande Western	2,593	1,815,955	361.216	2,331,979	278.900	367,355	41,922	853,859	88,772	1,664,619	71.40	667.360	512,137	555.017	447,064
Denver & Salt Lake	255	92,456	14,863	114.569	19,311	23,916	845	46,472	6,256	96,800	84.50	17,769	8,763	13.481	—66,360
Detroit & Mackinac	385	65.465	30 336	103.264	19.264	51.552	2,542	61,780	5.907	140.967	136.50	—37,703	—48,707	—45 096	—35,229
Detroit & Toledo Shore Line	61	266,407	.....	267,859	17.619	17,843	2,482	88,608	6 540	133,092	49.68	134,767	120,767	57,927	76.254
Duluth & Iron Range	294	68,710	16,756	99,788	41,899	81.975	1,130	169,282	15,095	249,381	249.90	—149.593	—156,134	—157.638	—210.037
Duluth, Missabe & Northern	405	70.603	38,187	126,255	67.415	125.901	3,143	147.101	21.131	366,496	290.30	—240.241	—285,416	—284,464	—343,625
Duluth, South Shore & Atlantic	591	154.974	86,910	267,791	43.972	57.803	7,786	183,533	12,243	310,816	115.10	—43 025	—50,025	—71,878	—138,110
Duluth, Winnipeg & Pacific	178	139,433	20,680	168,177	22,373	34.464	5,428	81,186	5.514	148,965	88.60	19,212	10,795	8.380	69,226
Elgin, Joliet & Eastern	839	1,362,617	3	1,467 640	115.613	328.626	12,372	481,542	33,573	971,637	66.20	496,003	412,106	326,100	699,019
El Paso & Southwestern	1,139	528,590	164,702	753.941	131,171	111,060	30.516	214,334	37.937	533,014	70.70	220,927	127,650	121,786	—36,928
Erie	1.989	5,621 664	1.051 256	7.177.250	704.436	2,050.501	143,698	3,558,218	288,195	6,785,976	94.50	391,274	199.303	493,029	—256,385
Chicago & Erie	269	745,901	52,209	850.378	105.226	132,628	20.162	432,136	38,132	725.746	85.30	124,632	77,080	—124.734	—522,994
New Jersey & New York	47	17,416	92,212	114,954	13,786	17,553	1,321	72,595	3,272	108,527	94.40	6,427	3.417	—15,538	—19,320
N. Y., Susquehanna & Western	135	221.178	59,268	324.440	26,295	55.991	4.092	194,558	11,113	292.049	90.00	32,391	6,552	—9,023	22,562
Florida East Coast	764	658,358	443.753	1.209,536	173,877	212.372	25,425	415,185	26,709	853,434	70.60	356.102	306,346	260.601	375,703
Fort Smith & Western	253	81,822	18,416	109,351	22,585	25.181	4,890	46,495	7.165	107,192	98.00	2,159	—3,709	—11.411	—17,230
Galveston Wharf	13	.....	.....	104,897	56,966	4,415	856	31.870	3,764	118,455	112.90	—13.558	—30,558	—30.490	108,473
Georgia	328	229,277	93,406	341,318	36,271	71,571	20,250	207,009	18,875	354,126	103.75	—12,808	—19,497	—10,231	—82,109
Georgia & Florida	405	70,961	13,176	91,672	17.644	20,289	9,177	45,539	6,449	99,312	108.20	—7,640	—13,885	—18,359	—53,882

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JANUARY, 1922—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses						Operating ratio.	Net from railway Operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
		Freight.	Passenger.	Total (inc. misc.)	Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.					
Grand Trunk Western	351	$799,288	$158,098	$1,012,782	$105,868	$201,580	$31,872	$576,718	$50,190	$972,948	96.10	$39,834	—$26,243	—$166,786	—$184,267
Atlantic & St. Lawrence	166	228,142	35,089	277,028	28,196	51,238	3,714	156,798	11,738	251,786	90.90	25,242	8,342	98,082	81,187
Chic., Det. & Canada Gr. Tr. Jct.	62	167,563	14,535	201,501	12,199	6,416	4,040	67,676	3,678	93,996	46.70	107,305	100,070	75,973	28,074
Great Northern	8,265	4,217,496	1,061,342	5,896,217	627,119	1,444,632	120,060	3,118,759	267 583	5,652,165	95.90	244.052	—333,502	—259,144	—1,555,177
Green Bay & Western	262	78,953	20,099	105,559	15,919	16,140	1,780	46,863	2,666	83,368	79.00	22,191	14,191	10,697	8,594
Gulf & Ship Island	307	167,669	39,186	219,294	44.051	46,835	7,218	74,939	11,589	179,147	81.70	46,147	19,105	13,931	12,050
Gulf, Mobile & Northern	436	280.855	37,135	329,828	56,952	53,552	14,550	121,764	18,526	265,344	80.40	64,484	48,486	41,407	8,515
Hocking Valley	350	812,035	86,657	938,295	101.690	186,265	11,508	355,429	31,542	686,421	73.20	251,874	161,220	124,467	—189,155
Illinois Central	4,799	8.665,695	1,909,599	11,199,098	1,362,190	2,451,416	207,410	4,337,013	300,133	8,689,227	77.60	2,509,871	1,581,188	1,633,742	2,053,528
Yazoo & Mississippi Valley	1,381	1,006,334	343,982	1,409,585	308,138	292,672	27,509	663,885	49,126	1,329,081	94.30	80,504	—38,038	—45,157	110,136
International & Great Northern	1,159	726.563	192,107	1,036,360	169,490	172,461	25.824	529,331	47,250	949,318	91.60	87,042	50,707	—10,001	—166,721
Kansas City, Mexico & Orient	272	89.906	10.026	107,442	27.236	27,024	4.895	65.120	6,186	130.461	121.40	—23.019	—31.339	—28,373	—69,140
Kansas City, Mex. & Orient of Texas.	465	89,344	11,306	106,631	28,871	46,863	4,564	76,006	6,189	163,493	152.30	—55,862	—61,849	—76,916	—46,493
Kansas City Southern	779	1,082,096	151,264	1,329,096	153,062	262,925	38,435	491,263	69,691	1,015,850	76.40	313.246	212,242	233,301	403,408
Texarkana & Ft. Smith	93	155,447	13,971	182,062	16,647	28,929	6,107	53,688	8,178	113,413	62.30	68,649	58,123	40,295	38,209
Lake Superior & Ishpeming	33	1.536	123	1 899	14.996	7.668	205	8,895	3,000	34,764	1,830.60	—32,865	—38,224	—38,290	—55,818
Lake Terminal	13	.....	.....	81,846	4,104	7,317	.....	37,832	56	49,309	60.20	32,537	26,200	36,166	2,081
Lehigh & Hudson River	96	191,425	4,530	204,918	28.727	49,877	1,382	90,588	6,674	177.248	86.50	27,670	17,492	—6,453	—17,266
Lehigh & New England	237	345.094	2,255	352,866	29.119	236,722	5,334	128,185	15,873	415,233	117.70	—62,367	—77,820	—60,616	13,959
Lehigh Valley	1,448	4.269.107	519,839	5,136.091	508.959	1,354,959	103.322	2.481,642	128,296	4,598,540	89.50	537,551	330,858	322,814	—431.242
Los Angeles & Salt Lake	1,159	958,393	384,503	1,473,540	263,036	329,346	43,529	561,232	41,958	1,280,413	86.90	193,127	85,800	43,602	—82,787
Louisiana & Arkansas	302	180,474	32,411	218,422	45,605	49.177	7,198	81,988	8.430	192,016	87.90	26,406	6,942	8.263	46,047
Louisiana Ry. & Nav. Co.	343	192,502	31,636	239.200	42,318	37,367	9,355	115,595	11.549	215,803	90.20	23,397	7,379	—10,640	—46,662
Louisville & Nashville	5,038	6.512 954	1,724.809	8,599,462	1,423.761	2,288,484	222.172	3,759.228	228.967	7,942,760	92.40	656,702	352,582	347.828	—587,421
Louisville, Henderson & St. Louis	199	137,316	55.963	203 243	46,028	39,943	5,735	79,514	8,307	179,527	88.30	23,716	14,957	7,805	4,024
Maine Central	1,215	1,105,196	311,148	1,522,612	264.393	306.613	12,242	750,954	44,599	1,378,748	90.50	143,864	44,802	41,551	—205,238
Midland Valley	383	245,564	63,686	319,495	44 666	55,499	4,495	114,066	14,811	229,571	71.90	89,924	78,184	68,573	21.048
Minneapolis & St. Louis	1,649	1.076.300	163,162	1,297.328	166 078	239.294	23.948	606.515	41.065	1,076,366	82 97	220,962	157,937	123,201	—6.185
Minneapolis, St. P. & S. S. Marie	4,383	1,883.161	541,200	2,662,129	284.663	834.998	57.107	1,477,776	103,427	2,762,838	103.80	—100,709	—339,132	—350,959	—974,515
Mississippi Central	271	93 321	17,414	114,975	15,916	36,655	5,457	41.485	7,159	106,672	92.80	8,303	2,038	734	—6,761
Missouri & North Arkansas	364	—515	—14	—521	2.086	3,452	553	2,945	3,330	12,566	.....	—13 087	—16,880	—19,280	—51,798
Missouri, Kansas & Texas	1,683	1,468.774	472.285	2 139,370	271.415	597.374	48.661	733.850	89.650	1.752,324	81.90	387.046	263.794	326.969	408.601
Mo., Kansas & Texas of Texas	1,738	1,035 272	429,302	1,583.727	288,441	287,028	45,981	710,793	77,214	1,418,719	89.60	165,008	111,230	—77,299	10,993
Wichita Falls & Northwestern	329	98,720	22,133	129 570	23.552	30.521	1,934	54,003	6.257	116.031	89.60	13,539	777	—17,304	36.478
Missouri Pacific	7,300	5.546.553	1,332,002	7,469,330	1,158.360	1,521.412	155,198	3,393,101	263.645	6,520,738	87.30	948.592	557.167	286,928	340.627
Mobile & Ohio	1,165	1.143.007	139.546	1,349 562	165.760	294 405	44 626	560.020	52,867	1 125 740	83 40	223 822	158,138	111.713	105.143
Monongahela	106	335,960	31,506	370.630	44.822	45,947	1,228	98,448	8 387	198,832	53.65	171,798	163,798	115,385	59.212
Monongahela Connecting	7	.....	.....	93,186	8,520	18,387	582	38,879	5,125	71,493	76.70	21,693	19.737	18,715	—35,899
Montour	56	74.752	773	76,782	15.181	31.752	972	24.772	6 456	79.133	103.10	—2,351	—4,825	7,436	20,405
Nashville, Chattanooga & St. Louis	1.258	988 963	374 008	1,456.123	215,312	429.248	68 563	675,947	64.284	1,462,149	100.40	—6.026	—41.626	—20,254	5,492
Nevada Northern	165	11,035	2,830	17.380	9.399	4,503	464	6.422	3.254	24,042	138.30	—5,662	—12.767	—9,624	—2,208
Newburgh & South Shore	7	.....	.....	99.484	4.944	24.235	.....	59 916	3,385	85,480	83.90	16.004	5,588	4,074	—3,581
New Orleans & Great Northern	274	152.348	34.104	194 223	34,233	48,893	4,676	70.754	9,488	166,617	86.80	25.606	10,568	302	20,991
New York Central	6.098	14,546,077	7,177.878	24.570 348	2,632.307	5.750.956	284,343	9,793,843	791.435	19,606.362	79.80	4.961.046	3,424,284	3,602,210	—227,868
Cincinnati Northern	244	224.903	16.494	247,686	44,805	45.049	4.846	88.219	8,272	190.654	77.00	57,032	41,590	23.465	—13,242
Cleveland, Cin., Chicago & St. Louis.	2,415	4,284,849	1,300,374	6,038,120	711 564	1,342.238	111,677	2,589,360	172,214	4,973.477	82.40	1,064.643	759,187	570,622	444,647
Indiana Harbor Belt	119	.....	.....	679.407	60,251	94,259	3,245	319,275	23,499	500 529	73.70	178,878	153.868	97,368	—160,747
Kanawha & Michigan	176	249,478	46.248	312,141	53,433	98.723	3,953	118.267	10,235	284.611	91.20	27,530	1,191	1.558	—39.159
Lake Erie & Western	718	624.444	35.436	682.256	107.128	121.698	18,769	307,901	32,761	588,210	86.20	94.046	53.858	54,320	—192,310
Michigan Central	1,862	3.322.504	1,421 711	5.277.044	627.357	1,144,813	89,916	2,178,720	156.931	4,266,209	80.80	1,010.835	770,632	677.278	507,067
Pittsburgh & Lake Erie	227	1,493.047	215.065	1,776,273	238.770	1,080.987	21,520	659.867	67.848	2,072,108	116.70	—295.835	—374,307	—269.961	400.258
Toledo & Ohio Central	503	702.614	65 546	790 408	121.307	174,877	10.729	334.463	26,520	670.677	84.90	119,731	64.705	65.739	—94.332
New York, Chicago & St. Louis	574	1,912.194	78 854	2,033.735	224.541	403.628	54,885	900,792	74.437	1,662 220	81.70	371.515	252,841	207,799	470,461
New York, New Haven & Hartford	1,986	3,929,396	3,895.109	8,774,503	932.455	1,531.177	50,931	4,111,332	311.059	7,047,294	80.80	1,677.209	1,289,953	892.565	—1,795,841
Central New England	295	479.430	19.525	528,074	71.807	100.848	4.031	227,781	12.732	417.070	79.00	111,004	88.940	55,759	40,013
New York, Ontario & Western	569	539 247	125 998	806.303	101.620	201.518	13.413	482,250	30.300	829,101	102.80	—22,798	—60.803	—92,419	—65.556
Norfolk & Western	2,237	5,143,163	666,255	6,027.671	851.403	1,469,047	73.579	2,171,890	145.978	4,734,676	78.50	1,292.995	842,124	989.345	1,002,286
Norfolk & Southern	930	386.300	111.180	519.865	97.219	105.407	22.319	281.745	30.493	537.640	103.40	—17,775	—43.231	—58.276	—56,462
Northern Pacific	6,658	4,268.122	1,143.344	5.987,826	736.166	1,873.875	133 608	2,945.096	237.874	6,013.408	100.40	—25 582	—778.144	—624,563	—432.316
Northwestern Pacific	507	276.649	171,001	507.399	105.061	84.753	5,880	247.554	15.095	459.812	90.60	47,587	2.431	—12.952	—87.145
Pennsylvania	7,373	24,255,599	9,844 249	37,322,163	3,670,513	9,791.210	502.649	15,047.658	1,145.788	30,852.303	82.70	6,469.860	5,379,683	4,966,088	37.856
Baltimore, Chesapeake & Atlantic	87	48,719	19,848	71,284	8,658	33,344	1,764	57.606	3,490	104,862	147.10	—33,578	—33,578	—32,188	—47.405
Cincinnati, Lebanon & Northern	76	55.620	6,863	77,139	14 649	18,853	1,666	55.148	2,688	93 004	120 60	—15.865	—20,729	—16,883	—34,249
Cumberland Valley & Martinsburg	33	90.485	6.553	99 189	6 644	16.980	962	29.829	2.398	56.813	57.30	42,376	38.083	33.378	25,170
Grand Rapids & Indiana	575	374.993	168,124	588.470	67,696	184.208	11,861	350,604	31,765	646.140	109.80	—57.670	—77,451	—94,413	—38,797
Long Island	398	596.373	1,143,399	1,921,303	231,406	392.890	15,140	1,038.872	55.645	1,752,530	91.20	168,773	127,321	68,976	—310,456
Maryland, Delaware & Virginia	82	41,060	13,617	56.958	6,565	17.784	498	47,770	2,026	74,643	131.00	—17,685	—17,685	—19,703	—14,673
New York, Philadelphia & Norfolk	121	293.281	71,436	405,798	51,952	150,207	9,106	271,633	15,353	507,246	125.00	—101,448	—113,278	—125,540	27,781

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JANUARY, 1922—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
Pitts., Cin., Chic. & St. Louis	2,412	$4,591,422	$1,689,798	$6,983,180	$558,682	$2,025,568	$107,250	$3,152,716	$213,884	$5,136,769	87.50	$846,411	$497,252	$298,387	—$141,760
West Jersey & Seashore	359	282,535	369,312	720,382	136,121	198,772	17,206	456,512	27,535	845,861	117.40	—125,529	—125,566	—141,846	—140,807
Peoria & Pekin Union	19	13,734	2,797	144,368	7,767	25,069	84	67,544	10,502	108,506	75.40	34,462	28,962	51,932	4,104
Pere Marquette	2,222	1,839,987	403,846	2,435,110	208,967	459,850	55,148	1,185,118	101,830	2,020,161	83.00	414,949	283,117	178,580	—290,141
Philadelphia & Reading	1,127	4,931,245	846,092	6,120,758	914,237	1,757,858	60,354	2,499,346	148,762	5,380,027	87.90	740,731	544,627	368,690	147,553
Atlantic City	127	95,001	120,053	221,641	54,993	Cr. 33,480	3,351	170,180	3,957	199,540	90.00	22,101	2,829	121	—156,592
Perkiomen	41	7,249	7,410	87,627	8,034	4,505	106	46,332	935	59,938	68.40	27,689	23,395	17,388	91,774
Port Reading	21	132,649	.....	148,229	14,849	8,789	229	64,166	1,250	89,283	60.10	88,946	74,573	7,681	36,721
Pittsburg & Shawmut	102	94,109	5,821	101,105	27,816	30,914	1,410	33,338	6,626	100,104	99.00	1,001	893	9,391	42,848
Pittsburg, Shawmut & Northern	210	83,955	7,510	94,469	14,894	28,838	2,189	44,289	12,007	102,270	108.30	—7,801	—10,078	—7,818	—20,333
Pittsburg & West Virginia	85	185,362	9,342	225,672	23,395	98,814	2,691	58,877	11,939	205,274	91.00	20,398	—212	54,299	17,454
Quincy, Omaha & Kansas City	252	41,930	21 8	72,818	21,633	17,324	914	47,835	2,262	85,116	116.90	—12,298	—15,733	—20,228	—43,108
Richmond, Fredericksburg & Potomac	117	294,791	330,206	751,156	82,920	111,089	7,2.3	307,270	26,227	554,495	73.80	196,661	161,200	108,311	63,813
Rutland	415	239,768	124,023	411,866	88,694	96,258	8,739	222,9.7	13,567	431,815	100.60	—19,949	—30,450	—29,237	9,970
St. Louis-San Francisco	4,760	4,018,007	1,400,964	5,881,133	684,345	1,107,450	84,501	2,378,181	202,140	4,445,360	75.60	1,435,773	1,167,215	1,246,763	1,269,905
Ft. Worth & Rio Grande	235	69,353	27,002	105,244	37,311	21,8.8	2,698	53,2.1	6,209	121,334	115.40	—16,090	—19,639	—24,560	—73,213
St. Louis, San Francisco & Tex	134	117,961	14,947	138,897	27,299	31,073	2,868	56,009	6,587	123,838	89..0	15,059	12,900	—10,847	—81,247
St. Louis Southwestern	968	1,133,898	137,410	1,321,807	224,223	210,275	46,272	354,536	54,390	895,120	67.70	426,687	3.1,591	330,926	374,291
St. Louis Southwestern of Tex	80/	500,641	92,031	623,513	162,558	163,047	19,758	322,152	31,550	699,399	112.20	—75,886	—99,9.6	—92,419	—146,839
San Antonio & Aransas Pass	739	278,843	63,1.3	364,8.9	95,863	111,441	9,170	200,002	24,752	449,925	120.80	—76,116	—80,550	—94,624	—94,879
San Antonio, Uvalde & Gulf	317	41,999	17,859	65, 76	13,971	10,315	2,627	32,219	6,454	65,586	99.70	150	—2,907	—12,293	—7,236
Seaboard Air Line	3,563	2,276,782	998,936	3,588,569	451,682	635,915	126 616	1,608,508	144,609	2,991,718	83.40	596,851	431,563	212,789	556,786
Southern	6,971	6,051,861	2,444,192	9,217,532	1,25.,428	1,716,797	204,074	4,183,.20	326,442	7,762,269	84.20	1,455 2o3	1,033,248	736,196	—626,055
Alabama Great Southern	313	504,189	136,436	6.3,418	78,155	149,441	20,931	309,585	25,506	590,316	87.70	83,102	52,307	81,395	—71,476
Cin., New Orleans & Tex. Pacific	338	912,486	326,647	1,304,606	130,453	311,163	28,432	485,644	41,454	1,007,316	77.20	297,290	242,846	266,519	—101,778
Georgia Southern & Florida	402	26 ,056	113,802	411,746	57,836	69,869	8,903	1.3,693	12,868	326,637	79.30	85,109	67,527	44,828	—85,876
New Orleans & Northeastern	207	371, 43	75,850	490,761	63,436	94,589	11,935	245,560	19,676	438,561	89.40	52,200	8,615	4,843	—108,493
Northern Alabama	110	71,425	11,308	85,066	15,966	4,448	1,860	3,7.6	3,3.9	63,423	74.60	21,643	17.573	—1,818	—15,904
Southern Pacific—Atlantic Steamship Lines	...	799,208	46,973	892,223	10,711	132,208	14,605	541,658	24,436	723,618	81.10	168,605	155,794	155,794	—132,044
Southern Pacific	7,110	7,844,833	3,385,978	12.431,735	1,952,571	2,516,303	236,122	4,799,503	442,098	10,204,166	82.10	2,227,569	991,174	948,796	1,231,625
Arizona Eastern	482	145,638	27,631	182,385	29,502	25,696	2,749	63,522	23,871	145,614	79.80	36,771	12,458	2,816	47,494
Galveston, Harrisburg & S. Ant	1,380	1,169,793	359,694	1,629,592	318,6.9	358,992	42,345	713,567	74,429	1,523,314	93.50	106,278	54,029	17,876	409,219
Houston & Texas Central	932	1,03.,1.7	315,9.1	1,413,881	201,089	251,509	24,338	503,454	41,609	1,021,826	72.30	392,055	347,549	277,715	92,242
Houston, East & West Texas	191	1e7,277	36,561	215,655	-6,867	59,308	3,002	112,527	8,562	226,930	105.20	—11,275	—18 813	—39,529	—16,517
Louisiana Western	207	324,015	90,327	544,795	59,533	109,775	8,113	111,868	13,031	312,508	8..70	42,287	14,740	9.297	103,233
Morgan's La. & Tex. R. R. & S. S.	460	412.,.3	154,630	608,396	186,247	179,914	16,7.3	274,695	32,45.'	695,163	114.30	—86,773	—131 860	—145,964	—137,543
Texas & New Orleans	567	632,922	151 741	828,814	115 9 4	176,030	13,119	294,515	2 ,832	632,845	76.40	195,969	171,581	128,813	—68,260
Spokane International	165	77,396	9,381	90,829	10 999	6,828	3,220	38,861	6,077	66,8.5	73.50	23,974	18,499	11,887	28,046
Spokane, Portland & Seattle	549	364,564	119,252	532 753	48,33)	98,008	7,719	199,380	19,802	380,955	71.50	151,798	67,6 6	69,633	—488
Tennessee Central	292	115,249	40 511	16 ,534	41,210	43,324	5,218	84,238	10,602	184,5.2	110.10	—17,038	—21,121	—35 644	—78,199
Tenn. R. R. Assoc. of St. Louis	37	.....	.....	391,213	69,634	36,455	992	131,191	8,247	250,239	64 00	140,9.4	85,584	199,797	158,040
East St. Louis Connecting	1	.....	.....	131,813	15,010	3,733	344	60,942	3,759	83,790	63 60	48,023	42,969	33,842	—2,381
St. Louis Mchs. Bridge Tenn	9	.....	.....	304,671	44,.05	17,428	954	152,084	6 858	221,529	72.70	83,142	67,307	88,575	7,708
St. Louis Transfer	6	.....	.....	107,087	11,222	2,368	202	35,412	2,045	51,249	47.90	55,838	54,895	46,525	60,041
Texas & Pacific	1,952	1,792,002	621,413	2,573,510	439,681	535,986	47,023	1,049,648	105,926	2,198,531	85.40	374,9.9	249,865	123,904	182.175
Toledo, Peoria & Western	247	70,662	44,551	123,135	22 419	41,253	2.513	77,622	7.870	151,677	123.20	—28 542	—38,546	—39,832	—36,140
Toledo, St. Louis & Western	454	663,995	25,382	720,148	67,921	133,904	20,893	263,047	19.437	505,202	70.20	214,946	168,443	138,556	52.073
Trinity & Brazos Valley	368	426,099	24 307	463,812	108 205	80,611	3,373	159,691	12,622	362,878	78.20	100,934	93,930	—7,581	—25,814
Ulster & Delaware	118	39,223	20,971	87,062	16 265	23,940	1.842	56,649	7,809	107,201	123.10	—20,139	—26,142	—29,230	—43,095
Union of Pa.	45	.....	.....	660 699	55,126	161,813	202	316 448	6 995	540,584	81.80	120 115	107,115	151,955	175,023
Union Pacific	3,665	4,930,128	1,231 401	6,813 033	560,460	1,533,674	126,638	2,444,078	313,058	5,116,548	75.10	1,696,485	1,129,394	1,050,064	760,409
Oregon Short Line	2,36'	1,990 102	395,157	2,567 359	268, 70	535,424	42.1.9	917,.07	124,238	1 933,340	75.20	634 019	358 001	328 376	—227,493
Oregon Wash. R. R. & Nav.	2,218	1,468 632	404,399	2,008,140	275,308	396,116	57 159	988 188	128,58'	1,870 887	91.80	16 ,253	—14,463	—97 101	—65 .267
St. Joseph & Grand Island	253	198,068	23,.68	231,31.	27,437	43,653	2,611	116,5.6	12,293	202,515	96.10	31,796	13 9 5	9 707	—39,015
Utah	1 1	1 5,.39	7 0	106,679	11 919	29,359	320	33 519	4,480	80,0.2	75.03	76 5 2	10 991	6 890	25,047
Virginia	526	1,264 900	62,594	1 415 160	173 441	3.1,759	13,52.	362 .10	31,568	903 457	63.83	511,703	4.0 956	418,660	430,918
Wabash	2,472	3,364,943	681,304	4,302,491	600 983	925,721	88.847	2,003,069	154,965	3,794,872	88 20	507,6.9	318, 22	70,050	—145,114
Western Maryland	804	1,306,536	77,259	1,478,266	195,203	233,849	32,111	531,579	46,455	1,108 372	75.00	369 894	319,894	263,752	236,603
Western Pacific	1,042	620,231	122,416	790,440	105,960	147,910	28,384	336,464	39,366	673,442	85.20	116,998	30,791	65,084	89,855
Wheeling & Lake Erie	511	827,056	71,043	967,372	128,657	195,873	17,092	407,651	34,492	787,362	81.40	180,010	89,970	61,084	—113,667

*This is the first month that this road has filed.

Management and Transportation Unions Fail to Reach Agreement

The Eastern railroads and the leaders of the enginemen's and firemen's brotherhoods announce that the regional conferences came to an end last week because of disagreement over the fundamental demands. All disputes concerning adjustments of wages and rules and working conditions will now be taken before the United States Railroad Labor Board. John G. Walber, secretary of the committee of managers, said that after it was apparent that a mutually satisfactory agreement could not be arrived at it was decided, as previously agreed, that all propositions made by either side in the hope of a settlement should be considered as though they had not been proposed. The leaders of these two brotherhoods have intimated that further negotiations may be had with some individual roads.

Wage Statistics for November

The Interstate Commerce Commission's summary of railroad wage statistics for November, 1921, shows a decrease of 21,783 in the number of employees as of the middle of the month compared with October. The total compensation decreased $12,298,953. For the maintenance of way and structures group the October report showed an increase of 6,171 employees over September, but in November there was a reduction of 31,140, or 7½ per cent. For the maintenance of equipment and stores group there was an increase in October compared with September of 18,823 employees and in November the number was further decreased by 11,594 employees, or 2.3 per cent. The total number of employees for November for Class I roads was 1,732,353 and the total compensation was $225,304,006.

Railway Returns for January

Reports of railway revenues and expenses filed with the Interstate Commerce Commission for the month of January make a very unsatisfactory showing in spite of the reductions in expenses that have been made. A preliminary compilation covering 199 Class I roads shows a net railway operating income of $29,560,210, which is at an annual rate of return of 2.6 per cent on the tentative valuation. For January, 1921, however, these same roads had a deficit of $1,525,500. The operating revenues of these roads, $394,786,058, showed a decrease of 16.1 per cent. Freight revenues decreased 15 per cent and passenger revenues 20 per cent. Preliminary reports show a decrease of about 9 per cent in net ton miles as compared with January, 1920, and the passenger traffic showed an even greater falling off. For the Western district the decrease in revenues was 17.3 per cent. Operating expenses of the 199 roads, however, $337,053,161, were 23.8 per cent less than for January, 1920. The Eastern district roads show a decrease of 25.3 per cent. It is estimated that the Eastern roads show a net return at the rate of approximately 4 per cent, the Southern roads 2½ per cent and the Western roads 1¼ per cent.

Hayden and Bell Required to Give Up Interlocking Directorates

The Interstate Commerce Commission has issued an order holding that Charles Hayden and M. L. Bell cannot continue to hold their offices with the Chicago, Rock Island & Pacific and at the same time similar offices with the Minneapolis & St. Louis. The commission had previously issued the order authorizing them to hold their positions temporarily pending a hearing on a protest filed by Newman Erb. Mr. Bell is authorized to hold the position of vice-president, director and general counsel of the Rock Island, and offices with subsidiary companies, or the positions of director and general counsel of the Minneapolis & St. Louis and director, member of executive committee and vice-president of the Chicago & Alton. Mr. Hayden is authorized to hold his positions as director of the Pere Marquette, director and treasurer of the Ray & Gila Valley, and director and vice-president of the Bingham & Garfield and the Nevada Northern; and either the positions of director, chairman of board, chairman of finance committee and member of executive committee of the Chicago, Rock Island & Pacific and of director of the Choctaw, Oklahoma & Gulf, or the positions of director, chairman of board of directors and chairman of executive committee of the Minneapolis & St. Louis, of director of the Railway Transfer Company of Minneapolis and of director and member of executive committee of the Chicago & Alton.

Mr. Hayden's application to hold the position of director of the American Railway Express Company is dismissed as unnecessary within the meaning of paragraph 12 of Section 20-a of the interstate commerce act. L. C. Fritch has withdrawn his request for authority to hold the position of vice-president of the Minneapolis & St. Louis.

Commission to Begin Hearings on Consolidation Plan

The Interstate Commerce Commission has announced the first of a series of public hearings on its tentative plan for the consolidation of the railroads into a limited number of systems which was adopted by the commission on August 3. The first hearing is to be held at Washington beginning on April 24 before Commissioner Hall. Evidence at this hearing will be confined to that part of the proceeding which affects the Southeastern region as described and referred to in Chapter 4 of the appendix to the commission's tentative plan. The appendix consists of Prof. Ripley's report on the subject. Respondents and other parties desiring to be heard should promptly advise the secretary of the commission, stating the interests they represent and their best estimate of the time they will require so that a schedule for the hearing may be prepared.

Convention of International Railway Fuel Association

The International Railway Fuel Association was organized to bring together railroad men interested in the use of fuel or its purchase and the mine operators or oil producers who supply railroad fuel. The program for the annual meeting of the association to be held at the Auditorium Hotel, Chicago, on May 22 to 25, embraces topics of interest to all these groups and in fact to everyone who is in any way concerned with the railroad fuel problem. A list of the papers and addresses which have been secured up to the present time is given below.

Opening Address—L. W. Baldwin, vice-president, Illinois Central.

Fuel Conservation from the Standpoint of

(a) Division Superintendent—Sidney U. Hooper, division superintendent, Baltimore & Ohio.

(b) Representative of Department Operating—Coaling Stations—W. S. Burnett, district engineer, Cleveland, Cincinnati, Chicago & St. Louis.

(c) Locomotive Engineer—C. J. Barnett, Illinois Central.

The Economic Considerations Governing the Use of Oil as a Locomotive Fuel—M. C. M. Hatch, mechanical engineer, Missouri Kansas & Texas.

Colloidal Fuel—Lindon W. Bates.

Mechanical Mining of Bituminous Coal—George T. Peart.

Standard Grading of Coal or Stabilization of Bituminous Coal—George H. Cushing, managing director, American Wholesale Coal Association.

Assigned Cars for Railroad Fuel—C. G. Hall.

The Relation of Overdevelopment of the Bituminous Coal Industry to Transportation—C. F. Lesher, editor, Coal Age.

The Government and the Coal Industry—T. H. Watkins.

Considering the Locomotive as a Big Investment, How Can We Get More Service Out of It?—G. M. Basford, president, G. M. Basford Company.

The Various Items of Saving by Using a Better Quality of Coal—Earl Cobb, president, Southwestern Coal Company.

The Effect of Tonnage Rating and Speed on Fuel Consumption—J. E. Davenport, engineer dynamometer tests, New York Central.

Educational Work Along Fuel Economy Lines—D. G. Buell, director, Railway Educational Bureau.

Standard Railroad Coal Contract—W. J. Tapp, fuel supervisor, Denver & Rio Grande.

Incentives for Promoting Fuel Economy—A Survey of Existing and Proposed Practices—O. S. Beyer, Jr.

In addition, papers will be presented by Professor E. J. Babcock, Harrington Emerson and F. S. Peabody.

Traffic News

R. C. Dearborn has been appointed chairman of the National Perishable Freight Committee, headquarters at Chicago, succeeding E. S. Briggs, resigned.

C. H. Easum, traffic manager for the Mississippi Lime & Material Company, and formerly associated with the Illinois Central, died at his home in Alton, Ill., on March 3.

E. W. Owen has been appointed traffic manager for the Southern Cypress Manufacturers' Association, at New Orleans, La., succeeding E. W. McKay, who has been elected secretary-manager.

The Southern Pacific has installed dining cars on its lines in Mexico between Nogales and Mazatlan. Combination cafe-parlor cars with a seating capacity in the dining room of 12 persons are used.

J. K. More, formerly associated with the Corporation Commission of Oklahoma, has been elected secretary-manager of the Oklahoma Traffic Association, Oklahoma City, succeeding H. D. Driscoll, who has resigned to practice law in that city.

The House committee on interstate and foreign commerce has decided to begin hearings on March 21 on the bill recently passed by the Senate authorizing the Interstate Commerce Commission to require the railroads to issue an interchangeable mileage book at a reduced rate.

The Transportation Club of Peoria, Ill., at its annual meeting held on February 28, elected G. I. Sweney, president; N. M. Love and O. F. Becker, vice-presidents; O. B. Eddy, secretary-treasurer; G. A. Smith, B. C. Fitton, E. M. Jones, F. B. Martin, and J. F. Hobin, directors.

The Southern Pacific was authorized by the Railroad Commission of California to put into effect on one day's notice round trip excursion fares from San Francisco to Calistoga, Napa, North Vallejo, St. Helena and Yountville. The tickets will be sold daily with a return limit of 25 days.

The Union Pacific has announced its intention to reduce trans-continental freight rates from 10 to 50 per cent on building materials and accessories (asbestos, cement, sheetings, roofings and bath tubs); eggs, nuts, insecticides, poultry, fish food, ammunition, glycerin, soda-fountain supplies, furniture parts, pole-line construction material, auto chassis and rotary blowers. The Southern Pacific has made a similar announcement.

The Traffic Club of Memphis, Tenn., has given its sanction to the proposed plan for a national association of traffic clubs. Preliminary plans for such an organization were made by a number of traffic club presidents at a meeting recently held in New York. It is expected that invitations will soon be sent to all traffic clubs asking that they join the Association and send two delegates to a first national convention.

Deep snow, with many drifts delayed all traffic between the Pacific Coast and points east during the last half of last week. The Western Pacific's trains between Salt Lake City and San Francisco were more than 18 hours late in some instances. The Chicago, Rock Island & Pacific's trains arrived in Kansas City 12 hours behind. The heavy snow and high wind storm visited practically the entire area of Kansas, Missouri, Oklahoma, Northern Arkansas, and the Texas Panhandle.

The presidents of seven of the leading traffic clubs of the country and representatives of a number of other traffic clubs met and formed a temporary organization in New York city on February 20 to further a movement to establish a nationwide organization of traffic clubs. W. J. L. Banham, chairman of the public affairs committee of the traffic club of New York and traffic manager for the Otis Elevator Company, was appointed chairman of the temporary organization and N. G. Campbell, president of the Newark Traffic Club, was appointed secretary.

Frank T. Riley, freight agent of the Michigan Central at Jackson, Mich., has been elected president of the newly organized Jackson Transportation Club. Other officers are: Vice-president, J. J. Lynch, traffic manager of the Hayes Wheel Company; secretary, J. C. Graham, traffic manager of the Chamber of Commerce; treasurer, W. R. Klien, chief clerk, Michigan Central; directors, G. B. Hunt, general freight and passenger agent, Michigan United Railways Company; Warren Zerby, traffic manager of the Earl Motors, Inc., and M. S. Hatch, ticket agent, Michigan Central. The club has 75 members.

The Wisconsin Traffic League held its annual meeting at Milwaukee, on February 25, and elected the following officers: President, C. M. Starks, traffic manager, Oshkosh Chamber of Commerce; vice-president, A. Murawsky, Milwaukee; secretary-treasurer, H. Dehrkey, Milwaukee; directors, Max Bloch, Racine; C. R. Jeffrey, Waukesha; E. E. Meadley, Ashland; O. A. Kroos, Kohler; F. M. Elkinton, Milwaukee; George Mergener, Milwaukee; W. H. Reynolds, LaCrosse; W. W. West, LaCrosse; A. C. Uecke, Milwaukee; L. A. Zimmerman, Beaver Dam; L. B. Maxfield, Milwaukee; W. J. Lahl, Chicago, Ill.; J. C. Chandler, Sheboygan; and C. J. Landuskey, Milwaukee.

Coal Production

Production of soft coal continues to increase slightly, according to the weekly bulletin of the Geological Survey. The output for the week ended March 4 is estimated at 10,536,000 net tons, an increase of 1.6 per cent over the week preceding. Production is still some 2,600,000 tons short of the maximum reached just before the mine strike of 1919.

Anthracite Shipments in February

Shipments of anthracite for February, as reported to the Anthracite Bureau of Information, Philadelphia, show a substantial increase over the two preceding winter months; 5,239,014 gross tons as compared with 4,848,053 tons in January, and 4,635,922 in December.

Shipments by originating carriers were as follows:

	February 1922	February 1921	January 1922
P. & R.	1,160,685	1,170,753	1,052,872
L. V.	857,579	1,063,508	766,602
C. of N. J.	537,214	515,551	542,558
D., L. & W.	755,923	920,788	744,768
D. & H.	670,323	813,191	619,762
Penna.	402,762	426,350	331,871
Erie	492,262	633,706	466,495
N. Y., O. & W.	141,929	153,017	101,779
L. & N. E.	220,337	269,237	221,346
	5,239,014	5,966,101	4,848,053

Elwell-Parker Electric Station Truck in Use on Government Railway, Japan

Commission and Court News

Interstate Commerce Commission

The Commission has issued an order in accordance with Section 441 of the transportation act designating points on railroads at which information shall be available concerning the handling of export shipments by common carriers by water in foreign commerce, and at which through bills of lading to foreign destinations in connection with ocean carriers, whose vessels are registered under the laws of the United States, to points in non-adjacent foreign countries, shall be issued.

State Commissions

The Louisiana Public Service Commission has imposed on the Louisiana Railway & Navigation Company a fine of $2,000 for violation of the terms of an order issued by the Railroad Commission in March, 1919, which required the road to repair and place in satisfactory condition its entire roadway, which was in very bad condition. On January 26, 1921, representatives of the railroad appeared before the Commission and stated that they had made every effort within their means to comply with the order and wished extended time to further carry out the betterment programs, which request was granted. The Commission now concludes, however, that little or nothing has been done to comply with that agreement. Service continues poor and derailments, congestions and other inconveniences are common. The present order calls for a further payment of $200 for each day hereafter that the railroad fails or refuses to comply with the original order.

Court News

Employee's Assumption of Risk—Irregular Trains

The Missouri Supreme Court holds that a man who had been in the railroad's service 25 years as engineman and knew there were no rules prescribing signals to employees when a train running west was using an eastbound track, and knew trains were run irregularly, assumed the risk of injury in stepping on the track, under the federal rule that a servant assumes extraordinary risks incident to his employment, or risks caused by the master's negligence, obvious or fully known and appreciated by him.—Quigley v. Hines (Mo.), 235 S. W. 1050.

United States Supreme Court

Intrastate Fares in New York

The State of New York sought by bill in equity to enjoin the enforcement of an order of the Interstate Commerce Commission requiring interstate railroads to charge 3.6 cents a mile for all intrastate passengers, to increase excess baggage rates to intrastate passengers, 20 per cent, to make a surcharge on sleeping-car passengers, and a 20 per cent increase in intrastate rates on milk, all for the purpose of bringing the intrastate rates to the level of the interstate rates previously fixed by the commission. The federal district court dismissed the complaint. The railroads appealed to the Supreme Court of the United States. That court has affirmed the judgment of the district court, saying in part:

"The main objections to the order are the same as those presented, considered and overruled in the Wisconsin Rate case just decided (*Railway Age*, March 4, page 519). The evidence in this case shows that if the passenger and other rates here in controversy were to continue in force as ruled by the Public Service Commission of New York, the annual gross revenues of the interstate railroads operating in the State of New York from both interstate and intrastate passenger and milk business would be less by nearly $12,000,000 than those revenues if the intrastate rates were on the same level as the interstate rates. If the lower level of intrastate fares and rates is to be maintained, it will discriminate against interstate commerce, and will require higher fares and rates in interstate commerce. . . ."—Opinion by Mr. Chief Justice Taft. Decided February 27, 1922.

Foreign Railway News

Proposed Increase in Indian Railway Fares

LONDON.

In the budget recently introduced to the Legislative assembly at Delhi, there is a proposal to increase railway fares in India by 25 per cent.

German Locomotives on Russian Railways

LONDON.

It is reported that the locomotives ordered by Russia from Germany are too heavy for the Russian railways and have caused the collapse of some of the railway bridges.

France May Lease State Railway

According to press dispatches to the New York Times, the French government is preparing definite plans for leasing the State Railway to a corporation. This system is one of the largest in France and for a number of years it has been the most unsuccessful from a financial standpoint, having piled up millions of francs in deficits.

French Railway Bonds on Sale in New York

New York investment houses are offering for sale 25,000,000 francs of bonds of the Midi Railway, France. These bonds bear 6 per cent interest and, since they are payable principal and interest in Paris, will increase in value as the exchange value of the franc returns to normal. The bonds are guaranteed principal and interest by the French government.

Big British Locomotive Company Closes Plant

LONDON.

Sir W. G. Armstrong, Whitworth & Co., Ltd., has decided to suspend operations at its Elswick steel works and its forge and stamping departments, owing to the high costs of production. No new contracts can be obtained on the basis of the selling prices which must be charged, and as it would be impossible to keep the shops open except at a loss, there is no alternative to the closing of them down.

British Roads Pay Dividends from Surplus

The Great Northern (England) earned a corporate net of £1,949,172 in 1921, a decrease of £300,968 compared with 1920, according to the Railway Gazette (London). In order to pay the 4½ per cent dividends on its ordinary shares, it is proposed to withdraw £207,261 from reserve funds. The company's business fell off tremendously in 1921 as compared with the previous year. Passengers (exclusive of season ticket-holders) fell off from 36,576,771 to 27,828,130. Season ticket-holders dropped from 60,275 to 55,725. Merchandise tonnage (long tons) dropped from 2,838,223 to 2,344,619 and fuel traffic from 6,731,018 to 3,272,984.

By the transfer of £205,000 from reserve funds the London, Brighton & South Coast proposes to maintain the regular dividend rate on its ordinary shares.

New Line from Tampico to Matamoros Proposed

The A. P. Turner Construction Company has applied to the Department of Communications and Public Works of Mexico for a concession to construct a railroad between Matamoros and Tampico, about 315 miles, according to advices from Matamoros. The company proposes that the government issue 6 per cent bonds to cover the cost of construction, the sale of the bonds to be undertaken by the company. The construction of this proposed line of railway has been under consideration from time to time for the last 30 years. When B. F. Yoakum and associates built the St. Louis, Brownsville & Mexico down the lower gulf coast of Texas to Brownsville, situated just across the Rio Grande from

Matamoros, they had in view the extending of the road down the Mexican coast to Tampico. Inability to finance the project caused its abandonment. The Mexican Government took up the matter of constructing the line and work on it was about to be started when the revolutionary period began and put an end to these plans. The territory through which the road would pass is rich in natural resources but is wholly undeveloped. It would shorten the rail distance between the Rio Grande and Tampico by nearly 200 miles.

Government Railways in Australia Lose Heavily

Taxpayers pay heavily for government control of Australian railways, according to the Wall Street Journal. Accounts for year ended June 30, 1921, show an aggregate loss for the commonwealth and five state governments of £3,793,365 after costs of operation and the interest charges.

The loss quota of the commonwealth government was £166,-551. The Trans-Australian line earned 8s. 9d. a train mile, and cost 12s. 7½d.; loss, exclusive of interest, amounting to £91,-339. The Oonadatta line lost £60,460, and the Northern Territory line £15,337. Loss on the Trans-Australian line was greater than in the previous year; freight receipts were £53,160 less than 1920, although passenger traffic gave increased revenue.

Reports of five state railroad administrations follow:

State	Earnings 1920-21	Deficit 1920-21
New South Wales	£14,267,205	£577,032
Victoria	9,795,763	651,635
Queensland	5,279,412	1,418,473
South Australia	2,942,028	561,304
Western Australia	2,270,032	418,370
Total	£34,554,440	£3,626,814

Store-Door Delivery in England

Cartage is one of the functions of the British railways, as a supplement to rail transport. The following description of the system appeared in Commerce Reports:

"Motor trucks have a well-defined and growing place in British transportation, for not only do they compete for traffic with the railways, but they are used by the carriers themselves in carrying on their business. The growth of motor transport during the past five years may be realized when it is stated that in 1916 there were but 600 road transport undertakings in England, while in 1921 this number had grown to 3,000 with a capital of £117,000,000, exclusive of business men who use their own fleets of motor trucks. A recent press estimate of merchandise hauled by road transport in the United Kingdom in 1921 was 6,000,000 tons.

"In Great Britain, railway freight traffic is divided into eight classes: A, B, C, 1, 2, 3, 4, 5. The rates for these classes graduate upward from class A. Goods embraced in the lettered classes include heavy basic commodities, such as coal, iron, cement, etc., charged at station-to-station rates, and are trucked by consignor at origin and by consignee at destination. The numbered classes are charged at what are known as 'collection and delivery' rates, which cover cartage from consignor's premises, the rail haul, and delivery at consignee's premises within a reasonable radius, which in London is about 4 miles and in rural districts 1 mile.

"At big railway centers, the trucking is usually done by the railways; but at rural stations, and even in some important towns, the companies occasionally contract with an agent to do the trucking for them. Under the regulations, a trader may elect to do his own trucking of freight in the numbered classes, in which event reduction from the rail rates is made as follows:

Class of freight		In London. s.	In London. d.	In rural districts. s.	In rural districts. d.
Class 1	per ton	9	0	4	2
Class 2	"	9	10	4	10
Class 3	"	11	6	5	6
Class 4	"	13	2	6	6
Class 5	"	14	10	8	2

"There are certain modifications of these allowances in some rural districts, but the above is a fair average and is representative.

"In addition to this freight traffic, the railways handle 'parcel traffic'—a business similar to that conducted by express companies in America. The British railways collect and deliver these goods from the shipper's door to the consignee's door at destination, the charges including collection, rail haul, and delivery.

"An important factor in British transportation is the cartage agent or forwarded. These firms maintain large fleets of vehicles, both horse-drawn and motor, and collect and deliver freight in London and most other largeci ties and towns. They charge the shipper the package rate, consolidate shipments for various destinations, turn them over to the railway companies in bulk, and are charged by the latter the lower rates which are applicable to large shipments after the fashion of the 'consolidated car' companies of the United States. The cartage agent thus makes the difference between the door-to-door railway package rates and the wholesale railway rates, while the railways are saved the expense of collection and have the advantage of handling one large shipment instead of a number of smaller ones. It is estimated that the railway companies receive and deliver about 70 per cent of their parcels business, the rest being handled by the forwarders."

Mexican (Vera Cruz) Railway to Build New Line

Following close upon the recent announcement of a modification by the Mexican government of the concession for the construction of the Pachuca & Tampico Railroad comes the authorized statement that the Mexican (Vera Cruz) Railway Company, a British corporation, has purchased a controlling interest in the Pachuca & Tampico from the heirs of the late Richard Honey and will finish building the line as fast as the work can be done. The Mexican (Vera Cruz) Railway runs between the port of Vera Cruz and Mexico City. It was one of the first railroads to be built in Mexico.

The taking over of this project by the strong British interests that own the Mexican (Vera Cruz) Railway is regarded as an assurance that it will be pushed to fulfillment as rapidly as possible. It is one of the most important transportation projects ever undertaken in Mexico for the reason that it will give direct connection between Mexico City and Tampico, shortening the rail distance between the two points by about 200 miles, and opening to agricultural development a big scope of rich lands. The fact that the road will have to mount from sea level to an altitude of more than 6,000 feet within a distance of 30 miles in order to reach the plateau region makes the engineering features of the project of unusual interest. It is explained, however, that a feasible route for this part of the line has been found and that the grade will not be excessive.

Approximately 45 miles of the Pachuca & Tampico already has been constructed. This part of the line runs from Pachuca to Ixmiquilpam. At Pachuca the new line connects with the branch road of the Mexican (Vera Cruz) Railway that runs to Ometusco where connection is made with the Mexico City-Vera Cruz line. The branch road will be made a part of the trunk line between Mexico City and Tampico, it is stated.

Announcement of the purchase of the majority stock of the Pachuca & Tampico Railroad comes from B. E. Holloway, general manager of the Mexican (Vera Cruz) Railway, with headquarters at Mexico City. The chairman of the board of the latter road is Vincent M. Yorke, of London, England. Mr. Holloway in speaking of the new transaction said in part:

"It is the intention of the Mexican (Vera Cruz) Railway to carry out the construction of the line to Tampico but its progress will greatly depend on how quickly funds can be obtained for carrying out the project.

"We have acquired very little rolling stock, an engine or two in need of repairs, and a few cars of various descriptions, so it will be necessary to restock the line with new material bought in the United States. The road will be single track, standard gage."

The route of the proposed extension of the Pachuca & Tampico Railroad, so far as surveyed and tentatively located, passes through the heart of the gulf coast oil fields. It will run just to the west of the intercoastal canal that connects the Panuco and the Tuxpam rivers. It will connect with the Tampico-San Luis Potosi division of the National Railways of Mexico at or near Tamos, about 30 miles from Tampico. The construction of a railroad between Tampico and Mexico City was started about 11 years ago by the National Railways of Mexico. More than 100 miles of grade was built and about 50 miles of track laid. The project was abandoned on account of the revolutionary disturbances.

Equipment and Supplies

Locomotives

THE CHICAGO & EASTERN ILLINOIS, is inquiring for 10 Pacific type locomotives.

THE KENTUCKY & TENNESSEE has ordered 1 Mikado type locomotive from the American Locomotive Company.

THE U. S. GYPSUM COMPANY, Chicago, has ordered from the American Locomotive Company 1, 0-6-0 type locomotive. This locomotive will have 20 x 26 in. cylinders and a total weight in working order of 130,000 lb.

CASTNER, CURRAN & BULLITT, Inc., Boston, Mass., has ordered from the American Locomotive Company 1, 0-4-0 type tank locomotive. This locomotive will have 14 by 22 in. cylinders and a total weight in working order of 79,000 lb.

JOHN B. SMITH & SON, LTD., Toronto, Ontario, has ordered from the American Locomotive Company 1, 0-4-0 type tank locomotive. This locomotive will have 13 by 20 in. cylinders and a total weight in working order of 65,000 lb.

THE ST. LAWRENCE BRICK COMPANY, Montreal, Quebec, has ordered from the American Locomotive Company 1, 0-4-0 type tank locomotive. This locomotive will have 9 by 14 in. cylinders and a total weight in working order of 29,000 lb.

THE AMERICAN BRAKE SHOE & FOUNDRY CO., New York City, has ordered from the American Locomotive Company, 1, 0-4-0 type tank locomotive. This locomotive will have 16 by 24 in. cylinders and a total weight in working order of 99,000 lb.

THE CALDAS RAILWAY, Columbia, South America, has ordered from the American Locomotive Company, 1 Mikado type locomotive. This locomotive will have 16 by 22 in. cylinders, a total weight in working order of 105,000 lb. and will be equipped with a superheater.

Freight Cars

THE NEW YORK, CHICAGO & ST. LOUIS is inquiring for 50 underframes.

THE GRAND TRUNK is asking for bids for the repair of from 250 to 500 box cars.

THE STANDARD OIL COMPANY of New Jersey is inquiring for 10 coal cars, of 50 tons capacity.

THE CHICAGO, INDIANAPOLIS & LOUISVILLE is inquiring for 100 sets of underframes and superstructures for gondola cars.

THE UNITED FRUIT COMPANY, New York, has ordered 25 ballast cars of 30 tons capacity from the Magor Car Company for export to Honduras.

THE GULF, MOBILE & NORTHERN is having repairs made to 100 steel underframe box cars, at the shops of the Anniston Electric Steel Corporation, Anniston, Ala.

DAVIS EQUIPMENT COMPANY, 50 Church street, New York City, is asking for prices on 40 gondola cars of 40 tons' capacity and 30 steel gondola cars of 30 tons' capacity for export to China.

THE TENNESSEE COAL, IRON & RAILROAD COMPANY, reported in the *Railway Age* of March 11, as inquiring for 150 ore dump cars has ordered this equipment from the Chickasaw Shipbuilding Company.

THE CHICAGO & NORTH WESTERN, noted in the *Railway Age* of March 11 as inquiring for 2,700 freight cars is inquiring for 1,250 40-ton box cars; 500 40-ton stock cars; 250 40-ton refrigerator cars; 250 50-ton gondola cars, and 500 50-ton flat cars.

THE DELAWARE, LACKAWANNA & WESTERN reported in the *Railway Age* of February 18, as asking for prices on the repair of about 900 cars has given an order to the American Car & Foundry Company for the repair of 985 steel hopper cars, of 40 tons capacity.

THE NEW YORK CENTRAL has ordered 250 steel underframe, double sheathed box cars of 40 tons capacity from the American Car & Foundry Company and has equally divided an order for 750 steel hopper cars of 55 tons capacity between the Pressed Steel Car Company, the Standard Steel Car Company and the Pullman Company.

Passenger Cars

THE FLORIDA EAST COAST is inquiring for 10 baggage cars.

THE CENTRAL OF BRAZIL is inquiring through the car builders for 50 first class coaches and 58 pairs of motor trucks.

THE LOUISVILLE & NASHVILLE is inquiring for 5 baggage cars, 5 combination baggage and horse cars, 6 coaches, 4 combination passenger and smoking cars and 5 combination passenger and baggage cars.

Iron and Steel

THE SOUTHERN RAILWAY is asking for bids until 12 o'clock noon, March 20, on 26,600 tons of 85 lb. A. S. C. E. section rail for delivery in approximately equal monthly installments from June to December 1, 1922.

THE GREAT NORTHERN is inquiring for 10,400 tons of structural steel for a 350 pocket ore dock; and 1,450 tons of structural steel for ore spouts, including bails and pins, at Superior, Wis.; and also for 750 tons of structural steel for reinforcement including stringers and shoes for four truss spans.

Miscellaneous

THE DIERKS LUMBER & COAL COMPANY, DeQueen, Ark., is inquiring for 40 arch bar trucks.

THE NEW YORK CENTRAL will receive bids until 12 o'clock noon, March 22, covering its requirements of track bolts, track spikes, fence wire, angle bars, offset splice bars, blank splice bars, frogs, switch points, track switches, crossings, bridge warning poles, structural steel, castings and rollers for repairs to bridges, lead covered cable, copper wire, repair parts for turntables, black galvanized and blue annealed sheets, driving and truck tires for locomotive service, seamless steel tubes, axles for car and locomotive repairs, wire nails and staples, steel bars, steel shapes, steel plates and steel billets.

Signaling

MITSUI & COMPANY, New York City, have ordered 62 sets of three color light signals from the Union Switch & Signal Company. These signals are for use on the Osaka Electric Railway, Japan.

THE UNITED STATES RAILROAD LABOR BOARD was created by an act of Congress on April 16, 1920, and was given an appropriation of $50,000 to cover all necessary expenditures up to and including June 30 of that year. This was known as the fiscal year of 1920 and the entire sum authorized was expended during that three months' period. The fiscal year of 1921 began July 1, 1920, and $450,000 was appropriated for this period of which amount $50,000 was available for either the fiscal year of 1920 or 1921. The sum of $17,604.18 was spent from this $50,000 in 1920, leaving a balance of $32,395.82. From the remaining $400,000, $399,821.23 was spent in the next year, leaving a balance of $178.77. The appropriation for the present fiscal year which will end on June 30 next, amounted to $370,000 of which sum $243,046.92, has already been expended. This leaves $126,953.08 available for use during the next four months. The expenditures of the labor board are said to average approximately $30,000 a month.

Supply Trade News

Ross E. Willis, formerly sales engineer of the Lakewood Engineering Company, Cleveland, Ohio, in the southern Michigan territory, has become associated with Wm. F. V. Newmann & Sons, Detroit, Mich., representing the **Baker R. & L. Company** in the Detroit territory.

William D. Pence, for eight years a member of the Engineering Board, Bureau of Valuation, Interstate Commerce Commission, and prior to that time engineer for the Wisconsin Railroad and Tax Commissions for seven years, has returned to practice as a consulting engineer with office at 608 South Dearborn street, Chicago.

The **Imperial Appliance Company** and the **Pressed Steel Manufacturing Company** have been merged with the **Union Metal Products Company.** The business of the three firms will be continued under the name of the **Union Metal Products Company,** with headquarters at Chicago, and no change will be made in the location of the various offices or in the personnel.

E. S. Fitzsimmons has been appointed manager of sales of the Flannery Bolt Company, Pittsburgh, Pa. He was born on April 12, 1876, at Columbus, Ohio. He served his apprenticeship with the Chicago, Rock Island & Pacific at Horton, Kan., leaving that company in 1899 to become foreman boilermaker with the Delaware, Lackawanna & Western at Scranton, Pa. In 1904 he served as general boiler inspector of the New York, New Haven & Hartford and from 1905 to 1907 as general foreman boilermaker of the Erie. He was then promoted to master mechanic at Galion, Ohio, and in 1908 was transferred as master mechanic to Hornell, N. Y., which position he held until 1912, when he was promoted to mechanical superintendent Erie, Lines West. In 1914 he was transferred to New York as mechanical superintendent of the Erie, Lines East, resigning in 1918 to become works manager for the McCord Manufacturing Company, Detroit, Mich. Mr. Fitzsimmons entered the service of the Flannery Bolt Company at Pittsburgh as salesman in December, 1920, and now becomes manager of sales of the same company.

E. S. Fitzsimmons

Bucyrus Company

The annual report of the Bucyrus Company for the year ended December 31, 1921, shows earnings of approximately $4 a share on common stock aggregating $445,905, a decrease of $565,079. The balance after dividends was $115,905, a decrease of $425,079. The ratio of current assets to liabilities was nearly 6 to 1, as there were current assets of $4,636,737, not including $163,530 in securities and current liabilities of $728,059, including $352,126 of accrued taxes and miscellaneous reserves. The statement follows:

INCOME ACCOUNT

	1921	1920
Net earnings	$445,905	$1,010,984
Dividends	300,000	480,000
Balance	115,905	530,984
Previous surplus	3,113,606	2,582,621
Total surplus	3,259,511	3,113,606

RESOURCES

Cash	268,139	567,083
Securities	714,524	163,903
Accounts and bills receivable	1,159,450	1,764,076
Inventories	2,658,152	3,179,007
Property account	7,187,303	7,126,091
Total	$11,987,571	$12,800,163

LIABILITIES

Accounts payable	142,954	624,673
Advance payments received	162,978	296,367
Preferred dividends payable	70,000	210,000
Accrued taxes and reserves	352,126	555,516
Preferred stock	4,000,000	4,000,000
Common stock	4,000,000	4,000,000
Surplus	3,259,511	3,113,606
Total	$11,987,571	$12,800,163

Chicago Railway Equipment Company

The financial statement of the Chicago Railway Equipment Company, for the year ended December 31, 1921, reveals a ratio of total current assets to total current liabilities of 23 to 1. Current assets at the end of the year amounted to $3,311,254 and current liabilities $148,317. Details follow:

	1921	1920
Net earnings	$350,699	$859,961
Depreciation	150,000	162,510
Dividends	239,744	299,370
Surplus	*39,045	398,081

*Deficit.

Lima Locomotive Works, Incorporated

The net income of the Lima Locomotive Works for the year ended December 31, 1921, was $1,136,592. After deducting the regular seven per cent dividend on the preferred stock amounting to $200,550, and a seven per cent dividend on the common stock amounting to $304,500, the amount credited to surplus was $631,542, making the total surplus on December 31, 1921, $2,470,994. Balance sheet details follow:

ASSETS

Current Assets:		
Cash on hand and in banks		$ 873,644.00
United States Treasury Certificates (at par)		2,000,000.00
Bills receivable		59,073.00
Accounts receivable		1,236,321.00
Inventories—Materials and supplies and work in progress		1,189,683.00
Interest accrued		30,677.00
Employees' preferred stock subscription account		74,664.00
Accident insurance fund (cash and government securities)		72,022.61
Miscellaneous deferred charges to operations		74,139.00
		$5,610,223.61
Property account—Land, buildings and equipment (less reserve for depreciation		3,499,069.00
Drawings, patterns, dies, etc.		1.00
Sundry assets at nominal values		3.00
Sinking Fund—First mortgage 6 per cent gold bonds, Lima Locomotive Corporation, due May 1, 1932 ($567.00 par value)		555,384.00
Goodwill		3,450,742.00
		$13,115,423.00

LIABILITIES

Current Liabilities:		
Accounts payable	$203,285.00	
Miscellaneous accrued liabilities	100,934.00	
Preferred stock dividend payable (paid Feb. 1, 1922)	50,137.00	
Common stock dividend payable (during 1922)	228,375.00	
Reserve for federal income taxes and contingencies	774,676.00	
Accident insurance reserve	72,023.00	
		$1,429,430.00
Bonded Debt:		
First mortgage 6 per cent gold bonds, Lima Locomotive Corporation, due May 1, 1932 ($567,000 in sinking fund)		2,000,000.00
Capital Stock:	Authorized	Issued
Preferred	$3,200,000	$2,865,000
Common	7,550,000	4,350,000
		7,215,000.00
Surplus December 31, 1921		2,470,994.00
		$13,115,423.00

Midvale Steel & Ordnance Company

The annual report of the Midvale Steel & Ordnance Company and subsidiary companies for the year ended December 31, 1921, shows a net loss after all charges of $5,313,513, as compared with a net income in the previous year of $12,424,920. After payment of dividends, the deficit was $6,313,513, against a surplus of $4,424,920 in 1920.

The company's balance sheet shows inventories valued at $36,319,212. Current assets amounted to $64,452,883 against current liabilities of $6,479,533. Of the assets, $4,336,126 consisted of cash and $13,222,718 government securities.

Obituary

Webb C. Ball, pioneer jeweler and general time inspector of the Official Bureau of Railroad Time Service, died on March 7, after several weeks of illness at his home in Cleveland, Ohio. Mr. Ball was born on a farm in Ohio in 1847. His first position was that of an apprentice to a watchmaker. After ten years' experience in that line of work he came to Cleveland and entered the retail jewelry business at which occupation he has been actively engaged for a period of over 50 years, his equipment gradually increasing from the original work bench and two show cases to an entire building and its furnishings. It was a railroad tragedy that gave Mr. Ball his greatest opportunity of service. On April 19, 1891, a collision occurred at Tipton, Ohio, between a fast mail and an accommodation train, and, from the inquiry which followed, it was found that the accident was due to defective watches in the hands of the train crews. Mr. Ball testified at the trial and was afterwards asked to further investigate the existing conditions and plan a reform. As the immediate result of his recommendation, he was authorized to inaugurate a standard system of time service and watch inspection for the Lake Shore & Michigan Southern, which system has since come in use on many large trunk lines. In August, 1913, he established a wholesale watch and jewelry business in Chicago, known as the Norris-Alister-Ball Company. Five years later he organized and chartered the Official Bureau of Railroad Time Service in both the United States and Canada and was made general time inspector of this organization, in which capacity he was serving at the time of his death. He is the originator of the "Ball" Watch.

W. C. Ball

Otis H. Cutler

Otis H. Cutler, chairman of the board of directors of the American Brake Shoe & Foundry Company, New York, who died at Miami, Florida, on March 4, as was noted in the *Railway Age* of March 11, has been a well known figure in the railway supply field for many years.

Otis H. Cutler

Mr. Cutler was born in New York city and educated at the Rockland Military Academy, Nyack, N. Y., and the Washington Law University. He served as private secretary to Senator William P. Frye, of Maine, from 1884 to 1895 and for the following three years was a member of the New York State Assembly from Rockland county. He started his business career as secretary of the North River Bridge Company and later became manager of the Ramapo Iron Works. He was instrumental in forming the American Brake Shoe & Foundry Company, serving as its vice-president and general manager in 1902, and from 1903 to 1916 as president, when he resigned and became chairman of the board of directors, the position he held at the time of his death.

During the recent war Mr. Cutler volunteered his services to the American Red Cross and organized and was the first manager of its Insular and Foreign Division. For his work in this direction he was made a major. After the armistice he spent considerable time in Europe assisting in the organizing of the League of Red Cross Societies, headquarters of which are at Geneva, Switzerland.

Mr. Cutler was identified with large and important enterprises in the industrial and financial world, being associated with many of the J. P. Morgan undertakings and he was director in numerous corporations, including: The Railway Steel Spring Company; American Arch Company; Bronze Metal Company; American Manganese Steel Company; Manganese Steel Rail Company; Southern Wheel Company; American Malleables Company; Dominion Brake Shoe Company, Ltd., and New York Telephone Company. He was also a member of many clubs and societies.

Trade Publications

LOCOMOTIVE BOOSTERS.—The Franklin Railway Supply Company, New York, has issued a new bulletin, No. 976, describing the locomotive booster and showing how it helps in railroad operation. The possibilities of increased tonnage and greater revenue earning capacity from locomotives equipped with a booster are pointed out and diagrams are given which graphically show the increased tractive power in starting and at slow speeds.

CUTTING TORCH.—A leaflet fully describing the various features of design and construction of the Airco "D" cutting torch has been issued by the Air Reduction Sales Company, New York. Sectional views of the torch are shown and tables given showing the thicknesses of metals that can be cut, the pressures of oxygen and acetylene necessary, and the gas consumption in cubic feet per hour when using tips adapted to the cutting of steel, cast iron or rivets.

THE SHEPARD ELECTRIC LIFTABOUT.—The Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., has recently issued a small illustrated folder descriptive of a new and smaller type of electric hoist, manufactured by that company. The text and illustrations show a wide number of purposes for which this hoist can be utilized to advantage such as the loading and unloading of freight, the shifting or storing away of material in storehouses, etc.

Photo by International

Dining Compartment in Private Train Which Carried Princess Mary and Viscount Lascelles from London After Their Wedding

Railway Construction

ALBERTA & GREAT WATERWAYS.—This company contemplates the construction of a boat landing at Waterway, Alta.

ATCHISON, TOPEKA & SANTA FE.—This company is accepting bids until March 20 for the construction of two one-story brick lavatory buildings in Chicago, one 24 ft. by 132 ft. and the other 216 ft. by 42 ft.

CANADIAN NATIONAL.—This company will extend its Vancouver, B. C., line for a distance of about 10 miles, the grading for which has already been completed and it is expected that the work will be undertaken by company forces as soon as weather conditions are favorable. The same company will also construct a line 3.5 miles in length connecting the Grand Trunk Pacific's Riverhurst, Sask., subdivision, and the Canadian National's, Craik, Sask., subdivision. The Saskatchewan Legislature Assembly recently adopted a resolution authorizing petitions to the Dominion Government asking immediate appropriations of money for the completion of the Canadian National branch lines projected into that province; and for the continuance of the construction of such lines until finished. Figures show that 342 miles of branch lines in this province have been graded, but only 231 miles of track laid thereon.

CANADIAN PACIFIC.—This company will construct coaling plants at Swift Current, Sask., and Medicine Hat, Alta., of 280 tons capacity, and like plants at La Riviere, Man., and Eagle River, Ont., of 100-tons capacity. An old trestle chute at Estevan, Sask., will be replaced by a more modern plant. The same company will also install automatic signals at Sidney, Man., and Ruler Creek, B. C.

CHICAGO, OTTAWA & PEORIA.—This company has been petitioned by the city of Ottawa, Ill., through the Illinois Commerce Commission, to rebuild its bridge across the Fox river at Main street in that city.

CHICAGO, ROCK ISLAND & PACIFIC.—This company has been petitioned by the city of Trenton, Mo., through the Missouri Public Service Commission, to construct a viaduct over its tracks at 12th or 13th streets, in that city.

GULF & SHIP ISLAND.—This company is constructing a new engine house 105 ft. by 220 ft., and a new machine shop of steel frame and brick construction, 75 ft. by 200 ft., to replace property destroyed by fire on February 25, of which a loss was estimated at $75,000.

ESQUIMALT & NANAIMO.—This company, in conjunction with the city of Victoria, B. C., is constructing a general traffic bridge over the harbor at Johnson street, in that city. A contract for the construction of the bascule span was awarded to the Canadian Bridge Company, Walkerville, Ont.

GREAT NORTHERN.—This company closed bids on March 15 for the construction of a 30-stall roundhous, shop buildings, storehouses and other terminal facilities at Minneapolis Junction, Minnesota.

ILLINOIS CENTRAL.—This company, which was noted in the *Railway Age* of March 4 (page 549), as accepting bids for the construction of a third track from Tucker, Ill., to Kankakee, a distance of approximately 5 miles, has awarded a contract for the work to M. L. Windham, Centralia, Ill.

MISSOURI PACIFIC.—This company, which was noted in the *Railway Age* of March 11, page 592, as accepting bids for the construction of a frame and stucco combination freight and passenger station, 23 ft. by 74 ft., at Jerome, Ark., has awarded a contract for this work to Jerome Moss, Chicago.

NEW YORK, NEW HAVEN & HARTFORD.—This company has awarded a contract to the Roberts & Schaefer Company, Chicago, for the construction of an 800-ton capacity reinforced concrete and steel coaling plant at Providence, R. I.

NORTH SHORE CONNECTING RAILROAD.—This company has applied to the Illinois Commerce Commission for authority to construct an electric railway system to extend through Evanston, Ill., and the village of Wilmette.

OKLAHOMA-SOUTHWESTERN.—This company contemplates the construction of extensions to its lines which will total approximately 33 miles.

PHILADELPHIA & READING:—This company has announced its intention to begin work on its ferry and railway passenger terminal at Camden, N. J., at a comparatively early date in order to complete the structure before the summer tourist season of 1923. The work will involve the expenditure of approximately $3,000,000.

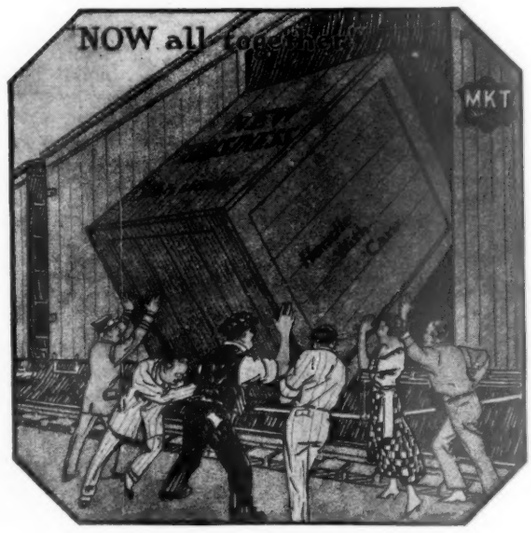
PITTSBURGH & SHAWMUT.—This company has awarded a contract to the Concrete Steel Bridge Company, Clarksburg, W. Va., for the construction of a reinforced concrete highway bridge over Colwell Cut, Colwell, Pa. The structure will be 220 ft. long with a span of 180 ft., 24 ft. wide, 110 ft. high and 24 ft. wide. The company has also awarded a contract to the Dwight P. Robinson Company, New York, for lining the remainder of its Mauk tunnel with concrete. Of this tunnel 1,200 ft. have already been so lined, with 900 feet yet remaining. The company has recently placed in service a new storehouse, oilhouse and car repair shed at its Brookville shops.

SALT LAKE & DENVER.—This company has been granted a two-year extension of time by the Public Utilities Commission of Utah in which to begin the construction of a railroad which will tap and develop the Uinta Basin, Utah. This corrects the item in the *Railway Age* of February 25 (page 502), which stated that this company was authorized to construct an extension to its lines from Springville, Utah, to the Uinta Basin.

ST. LOUIS-SAN FRANCISCO.—This company contemplates the construction of an extension from Vinita, Okla., to the mines of the Central Coal & Coke Company, a distance of about 5 miles. While surveys for this extension have been made, no definite decision has been reached as to the undertaking of the work.

YAZOO & MISSISSIPPI VALLEY.—This company is accepting bids for the construction of a passenger station at Webb, Miss.

FIVE CARLOADS OF ROSE BUSHES, a single shipment, were recently moved by freight across the continent from Los Angeles, California, to Riverton, N. J., 3,323 miles, in 12 days, or at the rate of about 276 miles per day. The movement was over the Southern Pacific, the Southern and the Pennsylvania. The shipment weighed 129,360 pounds.



Efficiency on the Missouri, Kansas & Texas

Railway Financial News

ATLANTA, BIRMINGHAM & ATLANTIC.—*Bondholders Start Foreclosure Proceedings.*—Foreclosure bills against this railroad were filed in the United States District Court at Atlanta, Ga., on March 11 by the Old Colony Trust Company of Boston, which holds $4,092,000 of bonds secured by a first mortgage on the line between Tifton and Montezuma, and by the Columbia Trust Company, of New York, which holds $5,161,000 of bonds secured by income mortgage bonds on the whole property except the physical property covered by the Old Colony Trust Company's mortgage. By consent of attorneys for these companies their bills were consolidated with the foreclosure bill brought a year ago by the Birmingham Trust & Savings Company. Judge Sibley ordered that Col. B. L. Bugg, the receiver in charge under the Birmingham Trust & Savings Company's foreclosure brought a year ago, should continue in charge and continue operation of the road pending the final determination of the foreclosure.

CENTRAL OF GEORGIA.—*Asks Authority for Equipment Trust.*—This company has applied to the Interstate Commerce Commission for authority to create an equipment trust under the Philadelphia plan for the purchase of 500 ventilated box cars at a cost of $825,000. It is proposed to pay 20 per cent of the cost from current funds and to issue $660,000 of 5½ per cent certificates which it is proposed to sell through Kuhn, Loeb & Co., or other bankers at 98.

CHICAGO, INDIANAPOLIS & LOUISVILLE.—*New Directors.*—Evans Woolen, Walter J. Riley, Philip A. Carroll and Lewis Iselin have been elected directors to succeed Fairfax Harrison, Adrian Iselin, Guy Cary and F. S. Wynn, who resigned last year.

CISCO & NORTHEASTERN.—*Granted Loan from Revolving Fund.*—The Interstate Commerce Commission has certified a loan of $31,000 to this company to assist it in acquiring two locomotives.

DENVER & SALT LAKE.—*Application for a Loan Denied.*—The Interstate Commerce Commission has denied the application of the receivers for a loan of $6,500,000 to enable the company to construct the tunnel through James Peak. The denial was based on the ground that the loan is not necessary to enable the company properly to perform the public service and that it is not justified by the prospective earning power of the road.

DETROIT & IRONTON.—*Proceedings Dismissed.*—The Interstate Commerce Commission has dismissed the proceedings relating to the application of this company for authority to acquire control of the Detroit, Toledo & Ironton by lease and for authority to assume obligations and liabilities in respect of certain securities of the lessor. The commission had previously granted the first application of this company for authority to construct an extension and a second application for authority to issue $1,000,000 of capital stock, but consideration of the application for authority to lease the road and to assume obligations and liabilities was deferred. The applicant does not desire to press the matter to a conclusion at this time and in order to close the record both applications, in so far as they relate to matters not already passed on, will be dismissed. The lease was opposed by certain minority stockholders who claimed that Ford was trying to "freeze" them out.

ESCANABA & LAKE SUPERIOR.—*Asks Authority to Abandon Line.*—This company has asked the Interstate Commerce Commission for authority to abandon a portion of its Northland branch from Northland to Camp Ten, 14 miles.

GREAT NORTHERN.—*Dividends on Semi-Annual Basis.*—The directors on Wednesday unexpectedly changed the dividend payments from a quarterly to a semi-annual basis making the payments February 1 and August 1 of each year.

A statement by Louis W. Hill, chairman of the board, says:

It is hoped that the regular 7 per cent basis will be continued, and that the 3½ per cent semi-annual dividend will be paid on August 1. By June conditions should be more settled and the directors will be able to appraise the business year of 1922. The Great Northern's earnings are always relatively low and expenses high during the winter months At so early a date as the middle of March, when May 1 dividend must be acted upon, agricultural conditions and the season's probable results are unknown These have been among the controlling factors in our changing to a semi-annual dividend basis. It is particularly advantageous this year for us to defer action until June

LOUISVILLE & NASHVILLE.—*Authority to Abandon Line Denied.*—The Interstate Commerce Commission has denied the application for authority to abandon a portion of a branch line from West Point to Pinkney, Tenn., 1.76 miles, as not justified in the public interest.

LOUISIANA & NORTHWEST.—*Purchased by Oil Company.*—Charles N. Haskell, former governor of Oklahoma and chairman of the board of the Middle States Oil Corporation, has purchased this road. It runs between McNeil, Ark., and Chestnut, La., through the Haynesville and Homer oil fields.

The Louisiana & Northwest has been in the hands of receivers since August 23, 1913. In June, 1919, the road was advertised for sale at an upset price of $600,000, but there were no bidders.

The new board of directors consists of J. T. Monahan, vice-president of the Metropolitan Trust Company of New York; W. M. Cannon, general counsel of Middle States Oil Company; Adam H. Davidson, of Dallas, Tex.; W. F. Carter, general counsel of the Boatmen's Bank, of St. Louis, and J. Sherry O'Brien, of New York.

Asks Authority to Issue Notes.—This company has applied to the Interstate Commerce Commission for authority to issue $400,000 of 7 per cent. promissory notes.

MIDLAND RAILWAY.—*Receivership Sought.*—Upon petition of T. R. Bennett, state superintendent of banks of Georgia, W. J. Donaldson, W. J. Oliver and H. B. Lindsay, Judge Meldrim in the Superior Court at Savannah, Ga., on March 7, issued an order for the Midland Railway to show cause on March 16 why a receivership should not be granted.

The petition alleges that the railroad is insolvent and is indebted to the Oglethorpe Savings & Trust Company to the extent of $275,000.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—*Dividends Reduced.*—This company has declared semi-annual dividends of 2 per cent. on the common and preferred stocks, payable April 15 to stock of record March 22. Previously the company paid 3½ per cent. semi-annually on both classes of stock.

MORENCI SOUTHERN.—*Asks Authority to Abandon Line.*—This company has asked the Interstate Commerce Commission for authority to abandon its line from Guthrie to Morenci, Ariz., 18.41 miles.

NEW YORK, CHICAGO & ST. LOUIS.—*Asks Authority for Equipment Trust.*—This company has applied to the Interstate Commerce Commission for authority to enter into an equipment trust agreement for an issue of $360,000 of 10-year equipment trust certificates at 5½ per cent for the purchase of 300 composite stock cars. The certificates are to be issued by the Union Trust Company and sold at 96¼.

NEW YORK, CHICAGO & ST. LOUIS.—*Control of Clover Leaf.*—See editorial in this issue entitled "Clover Leaf Acquired."

NEW YORK, NEW HAVEN & HARTFORD.—*Authorized to Extend European Debentures.*—The Interstate Commerce Commission has authorized this company to enter into agreements with the holders of $14,118,000 of dollar debentures and 69,762,500 francs of franc debentures of its European loan of 1907 for the extension of the maturity thereof from April 1, 1922, to April 1, 1925, and to increase the rate of interest from 4 per cent to 7 per cent. The agreement provides for the payment in cash of 10 per cent of the principal of the debentures to be extended and the commission has approved a loan of $2,758,000 to the company for this purpose. The company originally applied for a loan of $31,000,000 to pay off the loan and to provide additions and betterments to the amount of $3,000,000, but the plan of extension was later arranged. The commission has deferred consideration of the balance of the application.

Decree of 1914 Amended.—Judge Learned Hand in the United States District Court on March 10 signed an order extending until July 1, 1923, the time allowed the New Haven Railroad, by the dissolution decree of Oct. 17, 1914, to dispose of certain holdings in various New England trolley lines.

PENNSYLVANIA RAILROAD.—*Net after Rentals in* 1921.—For the 12 months ended December 31, 1921, this company's "Net after rentals" was $41,104,031, instead of $1,104,031 as was incorrectly given in the tables of Revenues and Expenses of Railways in the *Railway Age* of February 25, 1922.

TOLEDO, ST. LOUIS & WESTERN.—*Van Sweringen Company Acquires Control.*—The Van Sweringen Company of Cleveland, Ohio, has purchased the controlling interest in this road. O. P. Van Sweringen, vice-president of the Van Sweringen Company, is chairman of the board of the New York, Chicago & St. Louis, and, with associates controls it.

See editorial in this issue entitled "Clover Leaf Acquired."

TOLEDO TERMINAL.—*Asks Authority to Issue Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $400,000 of first mortgage 4½ per cent gold bonds to reimburse the treasury for expenditures and to make additions and betterments. It is proposed subsequently to sell these bonds and $214,000 of similar bonds now in the treasury but no arrangements for the sale have been made and the commission is asked to fix the price at which they shall be marketed.

UNION PACIFIC.—*Equipment Trust Agreement Authorized.*—This company has been authorized by the Interstate Commerce Commission to assume obligation and liability in respect of $6,800,000 of Union Pacific equipment trust certificates to be issued by the Commercial Trust Company of Philadelphia.

ZWOLLE & EASTERN.—*Authorized to Abandon Line.*—The Interstate Commerce Commission has issued a certificate authorizing this company to abandon its line amounting to about 10 miles in Sabine Parish, La.

Railroad Administration Settlements

The United States Railroad Administration reports the following final settlements, and has paid out to the several roads the following amounts:

Louisville & Nashville	$7,000,000
Alabama & Vicksburg	275,000
Minneapolis, St. Paul & Sault Ste. Marie	525,000
Narragansett Pier	7,500
Winona Bridge	47,000
SHORT LINES	
Spokane & British Columbia Railway Company	7,500

The payment of these claims on final settlement is largely made up of balance of compensation due, but includes all other disputed items as between the Railroad Companies and the administration during the 26 months of federal control.

Dividends Declared

Minneapolis, St. Paul & Sault Ste. Marie.—Common, 2 per cent, semi-annually; preferred, 2 per cent, semi-annually; both payable April 15 to holders of record March 22. Leased lines, $2, semi-annually, payable April 1.

Pittsburgh, Bessemer & Lake Erie.—Common, $0.75, payable April 1 to holders of record March 15.

Trend of Railway Stock and Bond Prices

	March 14	Last week	Last year
Average price of 20 representative railway stocks, close of business	61.45	59.66	54.11
Average price of 20 representative railway bonds, close of business	82.50	82.31	73.61

THE NUMBER OF PERSONS employed by the Interstate Commerce Commission on December 31, 1921, was 512 less than it was at the beginning of the year, according to a statement covering the various departments of the government furnished to the Senate by the United States Bureau of Efficiency. The decrease is mainly accounted for by the reduction in the valuation forces. On January 1, 1921, the commission had, according to this statement, 2,192 employees, of whom 975 were in the District of Columbia and 1,217 in the field. Most of those in the field were in the valuation bureau. At the end of the year the total was 1,680, of whom 1,416 were in the District of Columbia and only 264 in the field. A large number of the valuation employees were transferred to Washington as the district offices were discontinued.

Railway Officers

Operating

C. F. Urbutt, trainmaster of the Chicago, Milwaukee & St. Paul, with headquarters at Perry, Iowa, has been transferred to Savanna, Ill., succeeding **F. H. Allard,** who has been transferred to Ottumwa, Iowa. Mr. Allard succeeds **T. P. Horton,** who has been transferred to Portage, Wis., to succeed **W. G. Bowen,** who has been transferred to Perry, succeeding Mr. Urbutt.

Engineering, Maintenance of Way and Signaling

G. H. Nickerson, superintendent of construction in the county engineer's office, Merced County, Cal., has been appointed chief engineer of the Yosemite Valley Railroad, with headquarters at Merced.

Traffic

J. R. Hundley, traveling freight agent of the Wabash at St. Louis, Mo., has been promoted to district freight agent with headquarters at East St. Louis, Ill., succeeding J. H. Wack, transferred.

Purchasing and Stores

C. C. Kyle, acting general storekeeper of the Northern Pacific, with headquarters at St. Paul, Minn., has been promoted to general storekeeper with the same headquarters, succeeding O. C. Wakefield, deceased.

Special

A. K. Ragsdale, traveling passenger agent of the San Antonio & Aransas Pass, with headquarters at San Antonio, Tex., has been promoted to general inspector, with the same headquarters. He will have supervision over safety, service and efficiency on the system.

Obituary

W. J. Jackson, division engineer of the Chicago & North Western, with headquarters at Winona, Minn., died on March 13, from pneumonia.

James S. Mackie, formerly treasurer of the Chesapeake & Ohio, the Hocking Valley, the Chicago & Alton and the Toledo, St. Louis & Western, died at Hackettstown, N. J., on March 11, at the age of 67.

Albert A. Polhamus, general agent, passenger department, of the Canadian Pacific, with headquarters at Los Angeles, Cal., died at his home in Pasadena, Cal., on March 10, from the results of internal injuries sustained in a fall.

John Wynn, assistant to the general manager of the Northern Pacific, with headquarters at St. Paul, Minn., died at his home there on March 9. Mr. Wynn was 58 years of age and had been connected with the Northern Pacific since 1889.

George K. Caldwell, chairman of the Southern Freight Rate Committee, with headquarters at Atlanta, Ga., died at Montclair, N. J., on March 8. Up to the time of his appointment on this committee, Mr. Caldwell was assistant traffic manager of the Southern Railway, with the service of which road he had been connected 26 years.

C. H. Niemeyer, acting engineer maintenance of way of the Pennsylvania, with headquarters at Williamsport, Pa., died on March 4 at Philadelphia. Mr. Niemeyer was born in 1869 and was graduated from Cornell University in 1891. The following year he entered the service of the engineering department of the Pennsylvania and served continuously in that department until the time of his death.